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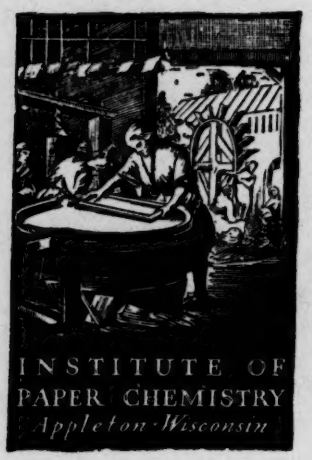
BULLETIN

OF

THE INSTITUTE OF PAPER CHEMISTRY



AFFILIATED WITH

LAWRENCE COLLEGE

APPLETON, WISCONSIN

LIBRARY NOTES

MARCH · 1950

Volume 20 Number 7

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Books and Pamphlets Added to the Library During February

BUILDING MATERIALS

JOY, F. A., QUEER, E. R., and SCHREINER, R. E. Water vapor transfer through building materials; a report of an investigation conducted by the Engineering Experiment Station of The Pennsylvania State College in cooperation with the Office of Technical Services, United States Department of Commerce. The Pennsylvania State College. Engineering Experiment Station. Bulletin no. 61. [State College, Pa.] The Station, 1948. 81 p.

CELLULOSE

JØRGENSEN, LEIF. Studies on the partial hydrolysis of cellulose. Oslo, Emil Moestue A/S, 1950. 176 p.

CONTAINERS

PACKAGING and display encyclopaedia [2d ed. E. Molloy, general editor] London, George Newnes Limited [c1950] *cf.* B.I.P.C. 18: 734.

VERSTONE, P. E. The manufacture of paper containers; the revised textbook on paper box and bag making. London, Verstone & Co., Ltd. [c1949] 293 p.

ECONOMIC CONDITIONS—YEARBOOKS

The ECONOMIC ALMANAC for 1950; a handbook of useful facts about business, labor and government in the United States and other areas. New York, The Conference Board, National Industrial Conference Board [c1950] 663 p.

INK

BRITISH STANDARDS INSTITUTION. Four-colour and three-colour process inks. British standard 1480: 1949. London, The Institution, 1949. 10 p. + 6 col. plates.

MANILA HEMP

BERKLEY, EARL E., HESSLER, LYLE E., BURNESTON, EDNA B., and CHEW, CHESTER F. A study of the quality of abaca fiber. U. S. Dept. of Agriculture. Technical bulletin no. 999. Washington [U. S. Govt. Print. Off.] 1949. 56 p.

PLASTIC MATERIALS

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY. *Plastics Committee.* Proceedings of 1948 plastics conference, Au-

gust 16-17, 1948, The Institute of Paper Chemistry, Appleton, Wisconsin. [Syracuse, Plastics Committee, 1949] 137 mimeographed leaves.

RADIO

The RADIO amateur's handbook, by the Headquarters Staff of the American Radio Relay League. 27th ed. West Hartford, Conn., The League, 1950. 605 + 10 p. (unnumbered index).

RADIOACTIVITY

U. S. NATIONAL BUREAU OF STANDARDS. Safe handling of radioactive isotopes. National Bureau of Standards handbook 42. Washington [U. S. Govt. Print. Off.] 1949. 30 p.

STRAW

GROTHAUS, CLARENCE E. Pulp and paper from Kansas straw; a study sponsored by the Kansas Industrial Development Commission. Lawrence, Kansas, University of Kansas Research Foundation [1949] 29 p.

TRADE AND PROFESSIONAL ASSOCIATIONS

JUDKINS, JAY. National associations of the United States. U. S. Department of Commerce. Washington [U. S. Govt. Print. Off.] 1949. 633 p.

UNIVERSITIES AND COLLEGES

UNIVERSITIES of the world outside U.S.A., ed. by M. M. Chambers. 1st ed. Washington, American Council on Education, 1950. 924 p.

Survey of Periodical Articles

The following are abstracts of opinions expressed by writers in the technical journals. The Institute of Paper Chemistry takes no responsibility for the opinions here summarized.

ADHESIVES

YOWELL, L. Q. New adhesives for the paper converting industry. Am. Paper Converter 24, no. 2: 24-5, 30 (February, 1950).

The results are given of a survey made to determine the new products which the leading adhesive manufacturers have developed as a result of wartime and postwar research. These new adhesives, along with the claims made by their manufacturers, are listed according to their function, e.g., those used in the envelope and bag industries, water-resistant resin emulsions, laminating adhesives, those used for making cellulose acetate decorative laminations to printed papers, labeling adhesives, and specialty adhesives. J.A.B.

ADVERTISING

WHEELWRIGHT, WILLIAM BOND. Barnum believed in advertising. Paper Maker [U. S.] 19, no. 1: 1-5 (February, 1950).

A brief history is given of P. T. Barnum's American Museum and "The Greatest Show on Earth," illustrating the ways in which his spectacular advertising made him one of the best patrons of the paper industry. Numerous illustrations. J.A.B.

ALKALINE PROCESSES

EGUCHI, H., and ITO, H. Variation of kraft-pulp strength with degree of digestion. J. Japan. Tech. Assoc. Pulp Paper Ind. 3, no. 1: 37-41, 58 (February, 1949). [In Japanese; English summary]

Several kraft pulps were cooked to various degrees of digestion and were examined for changes in strength at different freenesses. The tests indicated that the tensile and bursting strengths reached a maximum at a Roe number of 10-12; tearing strength increased with prolonged cooking. 9 figures and 4 tables. E.G.S.

ALKALINE PROCESSES—RECOVERY

BROMAN, BROR. A new method for cleaning heating surfaces. Svensk Papperstidn. 52, no. 23: 589-91 (Dec. 15, 1949). [In Swedish; English and German summaries]

The large amount of dust in the flue gases from sulfate recovery operations causes difficulties in the cleaning of the secondary heating surfaces. Flushing with water has been used; however, the method has several serious disadvantages. A new method is described, called the Broman Steel Shot Cleaning, which involves dry cleaning with free falling steel shot (granulated pig-iron pellets, approximately 5 mm. in diameter). Deposits are effectively prevented with a resulting better heat economy and longer life of the unit. Several installations are already in operation and about 20 additional units will be started in the near future. A patent application for the system has been filed. It is expected that it will be suitable for different kinds of heating surfaces and fuels. 5 illustrations. E.S.

TROBECK, K. G. The BT-system for soda recovery in sulfate mills. Svensk Papperstidn. 53, no. 1: 8-12 (Jan. 15, 1950). [In Swedish; English summary]

The Bergström-Trobeck (BT) system for evaporating and burning black liquor is described. Black liquor evaporated in multiple-effect evaporators to 50-55% dry solids is further concentrated by superheated steam (about 425° C.) which is injected into the black liquor in a special concentrator at 10 atm. pressure. The concentrated liquor is blown continuously from the bottom of the concentrator to atmospheric pressure and thereby still further dried. The moisture content of the liquor fed to the smelting furnace is about 10-15%. The pressure in the concentrator is maintained constant at 10 atm. The water evaporated during this final concentration is obtained in the form of steam. This steam is dirty, but may be converted into clean steam at a somewhat lower pressure in a heat exchanger, or used for preheating either the 50-55% black liquor fed to the concentrator, or the boiler feed water. The weak liquor must be oxidized prior to concentration to obtain a suitable fuel; without prior oxidation, the concentrated liquor forms pitch in the smelting furnace before it starts to burn, which prevents the admitted primary air from penetrating the fuel pile. This oxidation is carried out with air in a special tower provided with screen bottoms; it also presents other advantages. Sulfur losses are reduced to a minimum, and a cleaner condensate, higher sulfidity of the white liquor, and reduced lime consumption in causticizing result. Corrosion in the multiple-effect evaporators is noticeably reduced. The first BT-system has been in operation in the sulfate mill at Norrsundet, Sweden, since 1943; during this period, an average of 4120 kcal./ton of pulp has been obtained. The advantages of the BT-system are a higher steam production per ton of pulp than with previous alkaline recovery methods and the highest possible heat economy resulting from the concentration of the black liquor to dryness. 1 table and 4 figures. E.S.

BACTERIOLOGY

SHEMA, B. F. Further studies on the lethal effect of drier roll temperature upon bacteria in paperboard. Tappi 33, no. 2: 81-3 (February, 1950).

It has been shown that a heat-resistant strain of *Escherichia coli* (Frank) is killed in paperboard during the drying process. The experimental data collected show that the heat of the drier rolls is sufficient to kill all the coliform bacteria present, regardless of their position in the sheet. The total bacterial count of the wet web was reduced by 94.3%. 3 tables and 5 references. E.S.

BAGASSE

ANON. Bagasse used in Holyoke. Paper Trade J. 130, no. 6: 11 (Feb. 9, 1950); *cf.* abstract below.

The properties of the bagasse paper made by the Timlowski technique are evaluated. The pulp, which in many respects resembles cornstalk pulp, is short-fibered and reasonably slow and closes up well. The Mullen test is good, tearing strength low, and opacity poor. The finished sheet in newsprint weight had the appearance of a greaseproof paper; it was stiffer and harder than normal printing papers, and slightly brittle when dry. It had a sandy, not-too-smooth finish which, in turn, affected the printing quality. The yield was reported to be 55-60% after bleaching; the chemicals used and their consumption were not mentioned. From the results obtained to date it would appear that the logical grades for this type of pulp are 9-point corrugating

medium, lower grades of writing and tablet papers, various printing papers, and greaseproof and glassine. The material must be further studied and evaluated, also in terms of blends with other long fibers. E.S.

ANON. Paper from bagasse pulp is demonstrated in the "paper city." Paper Ind. 31, no. 11: 1294-5 (February, 1950); Printing Equip. Engr. 79, no. 6: 42 (March, 1950); *cf.* B.I.P.C. 20: 205-6.

In order to show that 100% bagasse pulp can be employed to make commercial grades of paper suitable for newsprint, a demonstration was given at the Chemical Paper Manufacturing Co., Holyoke, Mass., on Jan. 28, 1950, exhibiting a special edition of the *Holyoke Daily Transcript* which had been printed on paper made from bagasse pulp. This climaxed a series of experimental operations carried out by the Kinsley Chemical Co., Cleveland, under the direction of E. R. Timlowski. 4 illustrations. J.A.B.

BARK

BISHOP, C. T., HARWOOD, V. D., and PURVES, C. B. Separation of some chemical constituents from white spruce bark. Pulp Paper Mag. Can. 51, no. 1: 90-2 (January, 1950).

The ultimate object of this study was to discover new and possibly more advantageous ways of processing bark, a large-scale by-product of the wood pulp and lumber industries. A pilot-plant extraction of the airdry bark with methanol yielded about 20% of soluble material which was separated into aliphatic oils, fats, and waxes (1.5%), crude resin acids (1.5%), more complex phenolic substances (1.5%), and water-solubles (15.3%). Extraction of the bark residue with hot water removed an additional 20%, which consisted in the main of glycosides of complex phenols. Hydrolysis with boiling 1% sulfuric acid recovered up to one third of this amount as fermentable sugars. A similar hydrolysis of the original bark reduced about 15% to fermentable sugar and left the remainder in a condition which could be more readily dried. 5 tables and 8 references. E.S.

BARKERS AND BARKING

ANON. Vancouver engineer develops new hydraulic barker. Can. Pulp Paper Ind. 3, no. 2: 15-16 (February, 1950); Paper Mill News 73, no. 12: 78 (March 25, 1950).

A new hydraulic barker for sawmills is described, which was developed by Howard A. Simons. The simple rugged construction will process logs which are from 7 to 28 inches in diameter. The rotary head barker consists of two or three rotating-type nozzle assembly heads which act upon a log moving axially on a conveyor or rolls. A passing log intersects the high-velocity jets twice; bark and cambium layers are cleanly removed with no damage to the wood. The bark is carried by conveyor to the boiler house; all slabs and edgings which are too small for lumber can be chipped for wood pulp without further handling and cleaning. The barker is fully automatic and, except for starting and stopping, does not require an operator. 2 illustrations. E.S.

HOGAN, BILL. Portable debarkers. Wood 5, no. 2: 24, 44 (February, 1950).

The major types of portable debarkers are discussed briefly, including those which utilize knives to cut off the bark and those which crush the cambium by means of steel hammers or chains, thereby destroying the bond between wood and bark. The knife barkers are more wasteful in operation

than those of the second type, whose efficiency depends upon the season. The output and operational characteristics of portable debarking machines vary as much as the wood upon which they are used. In addition to the differences in bark and wood species, some of the other causes of variations are skill of the machine operator, crew organization, straightness and uniformity of the wood, season of the year, and the length of time since the timber was cut. The advantages of debarking in the woods include reduced handling and transportation costs and reduction of waste. 2 illustrations. E.S.

BEATING

HÄGGLUND, ERIK, and WEBJÖRN, BARBRO. The hardness of pulps. II. Svensk Papperstidn. 52, no. 24: 607-9 (Dec. 31, 1949). [In German; English and Swedish summaries] *cf.* B.I.P.C. 19: 612-13.

The authors extended their previous studies on the ease of hydration of sulfite pulps in relation to the lignin contents to sulfate pulps and came to the same conclusion, i.e., that in general, the ease of beating and hydration of commercial sulfate pulps is not affected by the lignin content, irrespective of whether the cooking was carried out with a high or low sodium sulfide content in the white liquors. Beating experiments with an ammonium sulfide holocellulose before and after bleaching with sodium chlorite showed that the presence of large quantities of lignin (15.2% in the unbleached pulp) impaired the ease of hydration prior to bleaching as long as the short-chain polyoses were protected or covered by the lignin. 6 tables and 1 diagram. E.S.

BENTONITE

BRAUNE, H., and RICHTER, I. The thixotropy of bentonite suspensions. Kolloid-Z: 113, no. 1: 20-9 (April, 1949). [In German]

The thixotropic properties of sodium bentonite dispersions were studied at various temperatures in pure water and in the presence of various electrolytes. The method of McMillen (J. Rheology 3:179-93 [1932]) was used to determine the yield point values. In pure water at 20° C. the maximum yield value A_∞ at bentonite concentrations in the range of 3 to 7% may be expressed by the equation $A_\infty = bC^a$ where a and b are constants having values of 2.0 and 1.63, respectively. The gelation of bentonite appears to be a first-order reaction except at the very beginning. The gelation velocity constant k was found to be independent of the bentonite concentration. The thixotropic properties of bentonite are largely characterized by the maximum yield value and the velocity constant. Upon adding electrolytes to water dispersions of bentonite, A_∞ passes through a maximum and the position of the maximum classifies electrolytes into two groups: those having monovalent cations and those having divalent cations or hydrogen ions. The gelation velocity constant is considerably increased upon the addition of electrolytes. In the range of 16 milliequivalents per liter, k is approximately ten times the initial value. The value of A is practically independent of temperature over the range of 20 to 40° C. (This is in agreement with the finding of Wolarowitsch and Tolstoi [Kolloid-Z. 73: 92-6 (1936)] for concentrated kaolin suspensions.) Over the same temperature range k increases in proportion to the fluidity of water. 4 tables, 11 figures, and 29 references. J.W.S.

BIOGRAPHY

ELLIOTT, HARRISON. Cyrus W. Field, a successful paper merchant. Paper Maker [U. S.] 19, no. 1: 7-9 (February, 1950).

The story of the life of Cyrus W. Field is told in brief; it is pointed out that, in addition to his achievement in laying the Atlantic cable, he was a successful paper merchant, having built up a profitable business in paper and paper mill supplies. 5 illustrations. J.A.B.

BLEACHING

ANON. New sulphite bleaching facilities announced by Mando. Paper Ind. 31, no. 11: 1297-8 (February, 1950); Can. Pulp Paper Ind. 3, no. 2: 16, 20 (February, 1950); *cf.* B.I.P.C. 20: 101.

The sulfite section of the recently completed bleach plant of the Minnesota and Ontario Paper Co. at International Falls, Minn., is now in operation, so that the plant is capable of processing 100 tons each of kraft and sulfite pulps every 24 hours. For sulfite pulping, a continuous two-stage process with direct chlorination and low-density hypochlorite treatment is employed, followed by vacuum washing. The No. 3 Insulite machine was to be shut down for about five weeks, during which time the entire machine was to be overhauled and fitted with improved equipment at both wet and kiln ends. 4 illustrations. E.S.

OKUNO, S. Bleaching of wood pulp. J. Japan. Tech. Assoc. Pulp Paper Ind. 3, no. 5: 29-36, 47 (September, 1949). [In Japanese; English summary]

A reduction of 4-5% in bleaching costs can be effected by the use of chlorine instead of bleaching powder; for instance, a Japanese mill with a 20-ton daily output might expect a gain of 3-6 million yen per annum. The chlorine process is especially adapted for the bleaching of kraft and straw pulp and yields a product with good strength properties. E.G.S.

BOARD

NORTHEASTERN WOOD UTILIZATION COUNCIL. Wallboard production and uses. Northeastern Wood Utilization Council, Bull. no. 31: 9-180 (January, 1950).

There is a growing interest in the production of wallboard as a method of utilizing the waste from wood-using plants. A one-day discussion conference on the subject was held at Cambridge, Mass., on Sept. 16, 1949, in cooperation with Harvard University. Representatives of domestic and foreign companies described their products and processes; machinery required for wallboard production was also discussed. The present bulletin gives the full text of the papers and their discussions; they are listed here by authors and titles: Sowinski, Edward S. Wood waste supply in New England, p. 9-12; discussion, p. 12-14 (*cf.* B.I.P.C. 20: 279); Nickerson, Joshua A. Demand for wallboard from dealers' standpoint, p. 15-20; discussion, p. 21-3; Asplund, Arne. Preparation and characteristics of fiber pulp for hardwood, p. 24-41; discussion, p. 42; Marpillero, Paulo. The Xilon and Abikraft processes for wallboard manufacture, p. 43-8; discussion, p. 48; Wyss, Oswald. Resin bonded boards from wood waste [Homogenholz N] p. 49-58; Othmer, Donald F., and Ricciardi, Louis G. Wallboard from wood waste without resins by a dry process, p. 59-77; Dale, John D. Durisol light weight precast concrete, p. 79-87; discussion, p. 87; Sears, Thomas W., Jr. Variables affecting the properties of wood waste molding, p. 89-104; discussion, p. 104-5; Vaughan, Thomas H. Resin bonded wood waste panels, p. 107-26—31 references; Caughey, Robert A. Development of Plaswood products, p. 127-30; Fischbein, William J. Production of wood waste boards by a continuous process, p. 131-6; Smith, Warren C. Wonderboard, p. 137-44; dis-

cussion, p. 144-5; Thweatt, H. D. Equipment for wallboard manufacture, p. 147-59; Linzell, H. K. The modern combination insulation hardboard factory, p. 161-6; Aries, Robert S. Summary and conclusions, p. 167-9; general discussion, p. 169-71; Elmendorf, Armin. Conversion of wood waste to ribbons and strands, p. 173-7; Williams, T. H. Gossite, p. 177; Chemical Engineering. Forest Hardboard, p. 177-8; Goodwin, R. G. The Chemipulper-Defibrator combination for the hardboard industry, p. 178; van der Borght. Linex boards, p. 179; and Smith, Roger R. Moulded sawdust products, p. 179-80. Tabulated data, illustrations, and diagrams are included in a number of the articles. E.S.

SCHWARTZ, FRITZ. Foreign wood fiberboards. Das Papier 4, no. 1/2: 16-20 (January, 1950). [In German]

The raw materials used in the manufacture of building boards, chipping, the various defibering processes (Boja-Jung, Masonite, Asplund), stock preparation, screening, board formation, the production of insulating and hardboards, conditioning, lacquering and impregnation, and resulting waste are discussed. L.E.W.

BOARD MILLS

ANON. Gibraltar's new mill; special attention to engineering. Pulp & Paper 24, no. 2: 30, 32, 34 (February, 1950); *cf.* B.I.P.C. 17: 220.

An illustrated description of the installation of the board mill of the Gibraltar Corrugated Paper Co., North Bergen, N.J., is given. The mill furnishes the 9-point paper requirements for corrugating and linerboard for the company's box plant. 15 illustrations. E.S.

BOARD SPECIALTIES

ALBANY CORRUGATED CONTAINER CORPORATION, *Cohoes, N.Y.* New corrugated brick pallet. Fibre Containers 35, no. 1: 20, 22, 27 (January, 1950).

The Albaco Brik-Pak, recently developed for use in forming a pallet load of 500 bricks, is made entirely of corrugated board, with the bricks themselves forming the feet or posts. The load is 40 inches long, 32 inches wide, and 30 inches high, with channel openings at the bottom for insertion of the fork of a lift truck. A 275-pound test, double-face scored sheet of corrugated board forms the base of the pallet load, and four 200-pound test, double-face, scored and slotted sheets form the sides, one wrapping each corner and extending to overlap the adjoining ones; the flaps do not entirely cover the top, leaving an opening for identification. Six round steel straps complete the pallet. Considerable savings in man-hours and cost are realized by the use of this pallet; the cost is about $1.00 per unit. 10 illustrations. J.A.B.

CAUSTIC SODA

HULME, RICHARD E. Heat content of anhydrous NaOH. Chem. Eng. 57, no. 2: 139-41 (February, 1950).

With reference to the paucity of references in the English language and the confusion existing in the literature on the subject, the author supplies data on the specific heats and heat content of solid and molten sodium hydroxide, which should form a basis on which the actual heat requirements in the various stages of caustic manufacture may be more accurately determined. 1 table, 1 diagram, and 9 references. E.S.

CELLOPHANE

ANON. New adaptation for "trap-door" cellophane bags. Packaging Parade 18, no. 205: 93 (February, 1950).

The Serugo Rubber Co., Akron, has solved its problem of packaging miniature rubber whistling dolls by the use of "trap-door" perforated cellophane. The pressure exerted by a large amount of trapped air is eliminated, the whistle is no longer muffled, and the undesirable confinement of the natural rubber odor is prevented. J.A.B.

ANON. Visibly yellow. Modern Packaging 23, no. 6: 102-3 (February, 1950); Food Inds. 22, no. 3: 494-5 (March, 1950).

The new oleomargarine package introduced by Swift & Co. consists of four parchment-wrapped, quarter-pound prints of yellow margarine, laid side by side and tightly overwrapped with heat-sealing printed cellophane. The label encircles the package like a band, leaving both ends of the four prints visible through the transparent surface. This type of package not only has self-service appeal, but is also very economical. 4 illustrations. J.A.B.

CELLULOSE—DEGRADATION

HUSEMANN, E., and GOECKE, M. Macromolecular compounds. 337. Weak links in oxidatively and hydrolytically degraded wood cellulose. Makromol. Chem. 4, no. 2: 194-207 (December, 1949). [In German] *cf.* B.I.P.C. 19: 539.

Previous investigations in this series have indicated that in cotton and ramie cellulose a different type of chemical linkage occurs at regular intervals of about 500 glucose anhydride units which, on hydrolysis or oxidation, reacts much more easily than the normal β-glucosidic linkages. In the present work the program has been extended to wood cellulose. The results are of particular interest because of the well-known differences in physical and chemical composition and, from a technical point of view, because wood pulp undergoes oxidation and hydrolysis in the manufacture of rayon or staple fiber. With more uniform chain-length distribution, working solution viscosities are lower, so that higher concentrations could be used. Purified beech and pine cellulose were used to produce oxidatively degraded samples by graded treatments with air in cuprammonium solution, and a hydrolytically degraded series from each pulp by treatment with 7% potassium bisulfate solution at 60° C. The D.P. was determined viscometrically on the cellulose in cuprammonium solution and on the cellulose nitrate derivative in acetone. The nitrated products were fractionated by precipitation with water from acetone solution. The D.P. of each fraction was determined osmotically and viscometrically, using the osmotic measurements to derive the Staudinger K_m constants to use in calculating the viscometric data. From the analysis of the changes in chain-length distribution it is concluded that the same accumulation of chains with D.P.'s of 400 to 500 occurs, both on oxidation and hydrolysis. The quantitative evaluation is complicated by anomalies in the viscosity values, because in contrast to the unitary distribution of cotton or ramie, wood pulp shows a two-component chain-length distribution. The periodic spacing of the weak linkages seems to be the same for all kinds of cellulose which have been examined, but on different celluloses there are differences in the ratio of the decomposition velocity compared with that of the normal β-glucosidic linkages. From electron micrographs (which are not reproduced in the article because they were destroyed) it is concluded that the weak links are arranged in planes perpendicular to the fiber axis. Further detailed investigations on this point are needed. 8 tables, 5 diagrams, and 11 footnotes. M.A.H.

STEURER, ERWIN. The properties and origin of mechanically modified high polymers. Melliand Textilber. 29, no. 4: 127-30; no. 5: 169-70 (April, May, 1948). [In German]

High-polymer substances, when submitted to the extreme mechanical action of the oscillating mill, show a deformation of the molecular lattice structure and a considerable breakdown of the individual molecules. The deformations of cellulose, cellulose ethers, and a polyamide have been studied, using x-ray analyses, volume changes, and calorimetric measurements. The structural deformation is not permanent because, by wetting and heating, crystalline x-ray diagrams reappear. The molecular degradation has been followed by determinations of viscosity and osmotic pressure. A limiting D.P. is reached on continued grinding which for cellulose, starch, glycogen, and polyvinylacetate seems to be characteristic of the individual substance. In contrast to thermal decomposition, it is concluded that the mechanical effects involve local energy increases which lead to the splitting of the primary valence bonds before the energy can be uniformly distributed. 2 tables, 8 figures, and 19 references. M.A.H.

CELLULOSE—HEMICELLULOSE

GAEBEL, R. Hemicelluloses removed on alkaline treatment. Kunstseide u. Zellwolle 27, no. 9: 307-9 (September, 1949). [In German]

The author gives tabulated data on the percentage of hemicellulose removed from various commercial dissolving pulps by alkaline steeping liquors and discusses briefly its effect on the rate of viscose filtration. Firm, stiff pulp sheets offer greater resistance to the removal of hemicellulose than soft, porous, thin sheets. 2 tables. L.E.W.

MACHIDA, SEISHI. The chemistry of hemicelluloses. J. Japan. Tech. Assoc. Pulp Paper Ind. 3, no. 6: 2-6, 50 (November, 1949). [In Japanese; English summary]

Hemicelluloses are extracted from plants with 4% caustic soda after preliminary extraction with water and 0.5% ammonium oxalate. They are divided into several related but distinct classes, namely the cellulosans (i.e., xylan, araban, mannan, etc.) and the polyuronides; the term hemicellulose can justifiably be applied only to the latter group. The properties, compositions, and structures of the hemicelluloses of many plants have not been thoroughly investigated. Recent advances in hemicellulose chemistry are discussed. 2 tables and 25 references. E.G.S.

ROSS, J. H. The effect of hemicellulose content on the physical properties of pulp. Pulp Paper Mag. Can. 51, no. 1: 93-8 (January, 1950).

Following a review and critical evaluation of the published data on the effect of hemicelluloses in papermaking, the author discusses the work on a series of pulps produced at the Pulp and Paper Research Institute of Canada (*cf.* Hart and Strapp, B.I.P.C. 18: 496) which show quite wide variations in chemical and physical properties as cooking conditions were varied. The data are reviewed in relation to the possible effect of hemicellulose and pentosan content. The conclusions drawn from this study indicate that there can be no doubt that the addition of the alkali-soluble pulp fractions to stock in the beater will speed the action of the beater; however, this should be regarded as a process of treating pulps to enhance their beating characteristics. Pulp with widely differing pentosan and non-

pentosan hemicellulose contents can be beaten at the same rate, but give entirely different sheet properties. Again taking pulps with very different pentosan and nonpentosan hemicellulose, the pulp with the higher pentosan content can be beaten more rapidly to give sheets with better strength characteristics; this order is reversed in certain pulps. The reason appears to be that such behavior is less connected with pentosan content or hemicellulose as it occurs originally in the wood, than it is with the effect of the pulping conditions on the fiber and, possibly, on these constituents. It is therefore not correct to say that hemicellulose and pentosan affect the pulp *per se,* but rather the manner in which a particular pentosan content or hemicellulose fraction in the pulp is reached during the digestion. The degradation of wood by bacterial action is detrimental to yield and, possibly, quality, but since it appears to aid beating, it might be possible to bring about some improvement in the pulp by micro-organisms acting on the pulp after it has been isolated from the wood. The pentosan content of the pulp will probably increase. This might be a method of proving that pentosan rather than other hemicellulose fractions is the effective agent in the beater. 2 tables and 16 references. E.S.

CELLULOSE ESTERS

HEUSER, EMIL, HEATH, MERLE, and SHOCKLEY, WM. H. The rate of esterification of primary and secondary hydroxyls of cellulose with *p*-toluenesulfonyl (tosyl) chloride. J. Am. Chem. Soc. 72, no. 2: 670-4 (February, 1950).

A chemically reactive cellulose was prepared by regeneration from cellulose xanthate solution, replacing the water in the swollen structure successively with methanol, ethyl ether, and cyclohexane. Two series of heterogeneous esterifications with tosyl chloride in pyridine were made on two such cellulose samples. The products were treated with sodium iodide in acetonylacetone to replace the tosyl groups on the primary alcoholic positions with iodine. From the data, the reaction for both primary and secondary alcoholic groups of cellulose was proportional to the concentration of such groups; the rate constant for substitution on the primary position was 5.8 times that for the secondary position. 2 tables, 2 diagrams, and 13 footnotes. E.S.

CELLULOSE ESTERS—NITROCELLULOSE

MOORE, W. R. Nitrocellulose-solvent interaction. J. Polymer Sci. 5, no. 1: 91-109 (February, 1950).

The interaction of fibrous nitrocellulose from cotton linters and solvents has been studied by means of absorption of the solvent from solvent-hexane mixtures, by swelling and solution in such mixtures, by precipitation from solution by hexane, and by viscosity measurements. Absorption and swelling results suggest that the size of the solvent molecules is important in determining the entry into amorphous or crystalline regions of the fiber. Swelling, viscosity, and precipitation results indicate a relationship between interaction and cohesive energy density of the solvent. It is suggested that current theories of polymer-solvent interaction, applicable where heat is absorbed in mixing, may also apply to the interaction of solvated nitrocellulose and solvent. 8 tables, 9 figures, and 29 references. E.S.

CELLULOSE ETHERS

ANON. Methyl cellulose in ceramic glazes. Chem. Inds. 66, no. 2: 244, 246 (February, 1950).

Methocel (methylcellulose), a water-soluble synthetic gum, has recently been found useful as a glaze slip ingredient; its function is that of a film

former, hardener, and binder. The addition of Methocel in wet milling should be accompanied by Polyglycol P1200 to inhibit foaming and the formation of air bubbles. J.A.B.

BUCCAR, M. DE. A new expedient: carboxymethylcellulose. Papeterie 72, no. 1: 3 (January, 1950). [In French]

The properties and uses of carboxymethylcellulose are discussed very briefly. L.E.W.

CELLULOSE FILMS, TRANSPARENT

ALLEN, ALBERT S., and ALLEN, NELSON. Tomato-film findings. Modern Packaging 23, no. 6: 123-6, 180 (February, 1950).

The results of various experiments in the packaging of tomatoes are tabulated to support the conclusion that package ventilation is essential, even with the most permeable films. Color photographs, taken after 10 days' storage at room temperature, indicate the effect of ventilation on the ripening of tomatoes wrapped in 300 LST cellophane, 100 cellulose acetate-1, and 100 cellulose acetate-2. The ventilated tomatoes ripened to a red color, whereas the unventilated ones remained green, with only those packaged in 100 cellulose acetate-2 showing any signs of ripening. Packages exposed to room temperature for four days were analyzed for oxygen and carbon dioxide, and it was found that the oxygen permeability of nonventilated films is not sufficient to supply the requirements of tomatoes. It is also pointed out that the high relative humidity built up in retentive films is conducive to the germination of many decay organisms. 5 tables, 3 illustrations, and 6 references. J.A.B.

CHEMICAL TESTING—PULP—CUPRIETHYLENE VISCOSITY

MCLEAN, J. D., and WALKER, FORESTIER. The precision of viscosity measurements on solutions of wood pulp in cupriethylenediamine. Tappi 33, no. 2: 57-9 (February, 1950).

The variables affecting the precision of the cupriethylenediamine viscosity test have been investigated and the probable sources of error in the ratio of ethylenediamine to copper, dispersion time, drying time, the time during which the pulp is shaken on solution, and the effect of oxygen are evaluated. It is also pointed out that equilibrium is reached slowly in a freshly prepared solution, and that reproducible ball-fall times are obtained only after a 10- to 15-minute interval. 5 tables and 6 references. E.S.

CHEMICAL TESTING—STRAW

ADAMS, G. A., and CASTAGNE, A. E. Determination of cellulose in straw holocellulose. Can. J. Research 27 B, no. 12: 907-14 (December, 1949).

Hydrolysis of wheat, oat, rye, and flax holocelluloses with 0.5% sulfuric acid for one hour at 100° C. gave a residue that was quantitatively equal to the Cross and Bevan cellulose from the same straws. The hydrolyzed holocellulose residue contained more lignin and less pentosan than the corresponding Cross and Bevan cellulose, but "pure" cellulose contents (cellulose corrected for ash, lignin, and pentosan) were very similar for both materials; the α-cellulose contents for the two fractions were also equivalent and were slightly higher than the "pure" cellulose. The α-cellulose contents of the holocellulose were higher than either the Cross and Bevan cellulose

or the hydrolyzed holocellulose residue when calculated on the basis of the original straw. The hydrolysis method has the advantage of permitting consecutive determination of holocellulose, cellulose, and α-cellulose on the same sample of straw. 5 tables and 16 references. E.S.

ADAMS, G. A., and CASTAGNE, A. E. Determination of lignin in cereal straws. Can. J. Research 27 B, no 12: 915-23 (December, 1949).

Determination of lignin in wheat, oat, barley, and rye straw with 64, 68, 72, 76, and 80% (by weight) sulfuric acid showed that a minimum yield of lignin containing a maximum amount of methoxyl was obtained with the 72% sulfuric acid. In this respect, cereal straws differ from deciduous woods for which 72% sulfuric acid lignin determinations are unsuitable. Comparison of lignin determinations made with 72% sulfuric acid and with 42% fuming hydrochloric acid, on the same straws, after pretreatment with 1.0% hydrochloric acid, showed that the former method preserves a larger proportion of the methoxyl groups. Both methods recovered more total lignin methoxyl from untreated than from treated straws, with the sulfuric acid retaining the larger amount. It is concluded that lignin determination with 72% sulfuric acid on straws untreated with dilute acid yields a residue most representative of the "true" lignin content, based on the criterion of maximum methoxyl recovery. 6 tables and 18 references. E.S.

ADAMS, G. A., and CASTAGNE, A. E. Distribution of methoxyl and uronic acid groups in cereal straws. Can. J. Research 27 B, no. 12: 924-32 (December, 1949).

The distribution of methoxyl and uronic acid groups in wheat and oat straw has been investigated in the following successive fractions: extractive-free straw, pectin-free straw, holocellulose, hemicellulose "A," hemicellulose "B," and "α-cellulose" residue. About 18% of the total methoxyl content of extractive-free straws was found in the holocellulose fraction, the remainder being associated with the lignin portion. Methoxyl groups in the hemicellulose fractions and residues accounted for only about 70% of those present in the holocelluloses. No glycosidic methoxyls were found and the amount of ester methoxyl was too small to account for losses by saponification. The conclusion was reached that some of the ether methoxyls were cleaved during the alkali extraction of the holocelluloses. Methoxyl values in the α-cellulose residues as obtained by the Zeisel method were considerably greater than those of the trimethylamine procedure. Uronic acid groups of the extractive-free straw were almost quantitatively accounted for in the various fractions. The molar ratio of uronic acid anhydride to methoxyl, which was less than unity in the holocelluloses, increased to greater than unity in the hemicelluloses A and B of both straws. 6 tables and 28 references. E.S.

CHEMICAL TESTING—SULFATE LIQUOR

MARTIN, GEORGE E. The hydrolysis of sodium sulphide in mixtures with sodium hydroxide. Tappi 33, no. 2: 84-91 (February, 1950).

A quantitative method has been developed for determining the hydrolysis of sodium sulfide in mixtures with sodium hydroxide over the ranges of concentration and temperature encountered in sulfate pulping. The method is based upon the quantitative solubility of mercuric sulfide in sodium sulfide and its insolubility in sodium hydrosulfide, sodium hydroxide, and water.

This method indicated that the sodium sulfide was about 40% hydrolyzed at the beginning of a typical sulfate cook and about 90% hydrolyzed at the end. The concentration of sodium hydroxide in the cooking liquor appeared to be the dominant factor in determining the degree of hydrolysis of the sodium sulfide; temperature and sodium sulfide concentration exerted only a minor influence. The determination of hydrolysis by conductance measurements, pH measurements and, indirectly, by calculation from acid ionization constants gave only approximate results. These methods had serious limitations as to concentration and/or temperature, although the order of magnitude of the hydrolysis results obtained at 25° C. was such as to lend additional support to the validity of the mercuric sulfide method. 11 tables, 5 figures, and 10 references. E.S.

CHEMICAL TESTING—SULFITE WASTE LIQUOR

CENTRAL LABORATORY OF THE CELLULOSE INDUSTRY. *Analysis Committee.* Determination of evaporation residue in sulfite waste liquor. Svensk Papperstidn. 53, no. 1: 13 (Jan. 15, 1950). [In Swedish and English] *cf.* B.I.P.C. 20: 514.

The text of Swedish Standard CCA22 is given, covering the method of analysis and the calculation. E.S.

CENTRAL LABORATORY OF THE CELLULOSE INDUSTRY. *Analysis Committee.* Determination of sulfate in sulfite waste liquor. Svensk Papperstidn. 52, no. 23: 597-8 (Dec. 15, 1949). [In Swedish and English] *cf.* B.I.P.C. 20: 390.

The text of the Swedish Standard CCA20 is given, covering the apparatus, reagents (formaldehyde, barium chloride, hydrochloric acid, and sodium carbonate), withdrawal of sample, testing procedure, and calculations involved in the method. 3 references. E.S.

CHEMICALS

CHEMICAL ENGINEERING. State of the industry. Chem. Eng. 57, no. 2: 91-122 (February, 1950).

A review of the chemical industry for 1949 is presented, covering information on profit and loss, supply and demand, labor, prices, plants and processes, products, and law and government during the past year. Data on the pulp and paper industry and raw materials of interest to the industry are included. Tabulated data, illustrations, and diagrams are also given. E.S.

HENGERER, D. W., and MACMULLIN, R. B. Four for two. Chem. Inds. 66, no. 2: 183 (February, 1950).

The authors maintain that pulp and paper producers who manufacture their own chlorine and caustic soda could make more economical use of raw materials and achieve lower-cost production by utilizing the usual excess of caustic soda as a raw material for sodium sulfide and by producing hydrogen peroxide for groundwood bleaching, concurrently with caustic soda. Several methods are described and the savings in cost estimated. The use of these procedures might release many pulp producers from a dependence on outside supplies. J.A.B.

CHLORINATION PROCESS

KATZEN, RAPHAEL, PEARLSTEIN, JOSEPH, MULLER, ROBERT E.,

and OTHMER, DONALD F. A new process for the separation of lignin and cellulose. Tappi 33, no. 2: 67-72 (February, 1950).

A new process is described for separating lignin and cellulose which utilizes chlorine in the presence of boiling methanol. Methoxy lignin chloride derivatives of the lignin are readily recovered, substantially different from methoxylated and chlorinated lignins previously obtained. The methanol-chlorination process is limited by diffusion, as are the standard pulping processes. Although extractives in wood have no appreciable retarding effect on the reaction, the moisture which is present must be limited to prevent conversion of the true chlorination reaction to an undesirable oxidative type of reaction. Semipilot-plant operation in glass equipment indicates the possibility of accelerating the process by continuous counter-current operation, yielding optimum delignification of a more resistant wood species, jack pine, in one hour at 60° C. 6 tables, 5 figures, and 41 references. E.S.

LAL, AMRIT. "Celdecor-Pomilio" process for the manufacture of pulp. Indian Pulp and Paper 4, no. 5: 199-202 (November, 1949); *cf.* B.I.P.C. 18: 57, 585-6.

The Celdecor-Pomilio chlorination process is described, including test data on straw and cost calculations. E.S.

COLORIMETRY

NICKERSON, DOROTHY. Munsell renotations used to study color space of Hunter and Adams. J. Optical Soc. Am. 40, no. 2: 85-8 (February, 1950).

The colorimetric scales of recent Hunter and Adams proposals are studied in terms of the smoothed curves of the Munsell renotation space. Three conversion tables provide: I.C.I. *(X, Y, Z)* data; Adams' chromatic value data; and Hunter's *a* and *b*. Each table extends to the theoretical hue, value, and chroma limits of the original table. Such use of Munsell renotation data makes it possible to visualize the color spacing of the co-ordinates of any color measuring instrument that is based upon or related to the I.C.I. system; it also makes it possible to understand instrument results in terms of color experience, and to assess the accuracy and precision of an instrument in terms of standard colorimetric practice and known color tolerance. 1 table, 3 figures, and 10 references. E.S.

TROY, D. J., JR., and GLASSER, L. G. Reducing stray light errors in the Hunter multipurpose reflectometer. J. Optical Soc. Am. 40, no. 2: 80-2 (February, 1950).

The use of the Hunter multipurpose reflectometer for color measurement has been limited, particularly at low reflectances, by inaccuracies arising chiefly from stray light in the optical system. A baffle is described whose installation greatly reduces stray light, so that its effect may be ignored above 2% reflectance. A method is also described for making corrections for stray light in those cases where its effect cannot be neglected. Application of these two procedures permits the Hunter reflectometer to furnish useful data down to reflectances of 0.1%. 1 table and 2 figures. E.S.

COMPRESSED AIR

HICKS, TYLER G. Paper mill air compressor operation. Paper Trade J. 130, no. 7: 19-21 (Feb. 16, 1950).

The average pulp and paper mill uses at least one air compressor for cleaning, humidification, valve operation, or fire protection. If properly operated and maintained, a compressor can be one of the safest pieces of equipment in the mill; poorly operated compressors present a hazard to all mill personnel, the mill structure, and machinery. All compressors should be located in a clean cool place; spaces subject to the accumulation of dust and dirt must be avoided. In addition, the author discusses guards, lubrication, the removal of cylinder deposits, the intake of clean air, compressor cooling and discharge, and satisfactory air receivers as some of the means within the control of every maintenance man to provide safe air-compressor operating conditions within the mill. 1 table and 3 figures. E.S.

COST—ACCOUNTING

PATCH, C. E. Cost accounting as an operating tool. Yearbook Am. Pulp Paper Mill Supts. Assoc. 30: 36-46, 48 (1949).

A bookkeeper's figures are not in a usable form and, therefore, generally not of much value to the operating man, whereas well presented mill statistics can be of great service to the mill superintendent, especially if they show relationships between variables. Supplemented by a number of charts, a statistical study of the causes of broke in three different mills under the same management is used to illustrate the efficiencies and weaknesses in the different operations of these mills. In conclusion, the method of preparing the charts is explained. 13 figures. E.S.

DIGESTERS

HAAS, RUDOLF. The problems of the Arbeitsgemeinschaft für Sulfitzellstoffkocher (Committee on sulfite digesters); retrospect and prospect. Das Papier 3, no. 21/22: 415-24 (November, 1949). [In German]

In the first postwar meeting of the committee (whose activities in the past included chiefly the safety problems of digester operation), the author discusses the present experience with carbon-brick linings (a combination of one layer of ceramic bricks next to the metal shell, covered with a layer of carbon bricks). Two vertical digesters gave satisfactory results, whereas the lining of a horizontal digester proved a failure. In the second case, the carbon-brick layer had been applied to an old ceramic base with a synthetic resin cement, whereas new ceramic linings with a litharge-glycerin-mortar and sodium silicate cement SWD-Z (I. G. Farbinindustrie), respectively, had been used for the vertical digesters. The importance of good adhesion of the linings to their supports, the use of cements with good swelling properties, and the influence of these factors are discussed. Safety devices and the possibility of plating digesters with acid-resistant steel linings are also mentioned. 17 figures. E.S.

ECONOMICS, INDUSTRIAL

FRIED, WALTER. Supply, demand, money and prices. Yearbook Am. Pulp Paper Mill Supts. Assoc. 30: 294, 296-8, 301; discussion: 301-2, 304, 307 (1949).

In the last few years, several attempts have been made to present basic economic concepts in new and pictorial ways. An interesting account is given of a new mechanical device developed by James D. Mooney of the Willys-Overland Co. to show the interaction of supply, demand, money, and prices. Colored water is used to symbolize the supply of goods flowing through

a plastic chute as demand through prices stimulates it. Also shown are the roles of inventories, as they affect the colored water of production, and of the supply of money, as it affects demand. The effect of price fixing and controlled production could also be illustrated. 2 illustrations. R.S.

EUCALYPTUS

RUNKEL, ROLAND O. H. Preparation of pulp from eucalyptus species and experiments with two different kinds of eucalyptus. Das Papier 3, no. 23/24: 476-90 (December, 1949). [In German]

The two eucalyptus species subjected to pulping were not identified, but were termed tan (I) and red (II). (I) and (II) showed marked differences in morphological properties and in the ease of pulping and bleaching. Full experimental cooking data are given. Pulping was carried out by first preparing a halfstuff (using a mild sulfate cook at 150° C. or an aqueous sodium hydroxide digestion at 100° C.), followed by defibration and an acetic acid-sodium chlorite bleaching. In general, (I) was more readily pulped than (II), but required longer (Jokro mill) beating to achieve a maximum breaking length and folding endurance than (II). Chemical and physical data of the various pulps are tabulated and compared. 7 tables, 2 photomicrographs, and 246 references. L.E.W.

FIBER—IDENTIFICATION

HEIM, OSKAR. Separation of cotton and rayon or cotton and acetate for analytical purposes. Anal. Chem. 22, no. 2: 360 (February, 1950).

A method is given for effecting a clean separation of cotton and rayon or cotton and acetate at room temperature, using a solution of sodium zincate and ammonium thiocyanate. The sample is treated with the solution, then the liquid is removed by means of a Gooch filter. Rinsings with hot water and hot 5% acetic acid remove the zinc present. The insoluble material is cotton; correction factors are given for calculating the results. This method has many advantages over the calcium thiocyanate method which is in general use at present. J.A.B.

FOLDING BOXES

ANON. Smorgasbord girl. Modern Packaging 23, no. 6: 118-20, 178 (February, 1950).

In order to achieve a uniform appearance in a wide variety of package forms, Scott Petersen & Co., Chicago, producers of quality sandwich meats, have adopted a new, more effective trademark and developed several new packages. A window carton, which contains a complete liner of transparent cellulose acetate film, is used for pork sausage links; for the distribution of pork sausage and potato sausage to the retailer, printed paraffin-coated paper containers in the 170 fluid ounce size, with snap-on lid, are used. The new trademark features a Scandinavian peasant girl holding a smörgåsbord tray. 5 illustrations. J.A.B.

BORCHARDT, L. F. The story of Pvequick. Modern Packaging 23, no. 7: 121-4, 166, 168 (March, 1950); Packaging Parade 18, no. 205: 59, 61 (February, 1950).

As an example of the work done by General Mills' organization for packaging selection, the development of the company's Apple Pyequick package is outlined. First the stability of the product is determined, then various packaging materials are tested until the appropriate one is found.

When this has been thoroughly tested, complete reports are prepared covering the stability of the product, packaging recommendations, and suggestions to the manufacturing and product control departments. These reports include full details and blueprints on cartons, liners, wrappers, and other materials, as well as their physical characteristics and recommended suppliers. Normally, members of the packaging research organization follow the product into initial commercial production and maintain an active interest in plant operations for periods varying from a few months to more than a year. 3 illustrations. J.A.B.

STAHL, GERALD. Hardware field becoming alert to self-service merchandising. Packaging Parade 18, no. 205: 54, 56-7 (February, 1950).

Many manufacturers of hardware have restyled their packages to take full advantage of impulse-buying psychology. An effective package clearly describes the product, explains its uses, and forcefully attracts attention by displaying the product. 5 illustrations. J.A.B.

FORESTS AND FORESTRY

DUERR, WILLIAM A., JAMES, LEE M., and STOVER, WILLIAM S. The new forest survey of Mississippi. Southern Pulp Paper Manuf. 13, no. 2: 18, 20, 22, 24 (February, 1950).

A summary of the timber situation in Mississippi is presented, based on a comparison of the data obtained in the two forest surveys in 1932-35 and 1946-48. Forest acreage; timber volume and growth; commodity drain; tree species, size, and quality; and timber management practices are covered. During the 14 years between the surveys, the character of the wood-using industry changed markedly; in lumber, there was a continuous shift toward smaller operations, whereas in pulpwood there was a five-fold increase in production. Large acreages of forest land were acquired by corporations having a conservation policy. However, Mississippi's forests still require tremendous improvement. There is no state fire protection in most of the counties. 6 figures. E.S.

GARLAND, HEREFORD. State forest products research in Michigan. Paper Trade J. 130, no. 7: 22-4 (Feb. 16, 1950).

Although the forest resources and forest products industries of Michigan have changed markedly since the time when it was the nation's leading lumber producer, they are still major elements in the economy of the state. Forest products research has been officially recognized as an instrument for guiding changes in wood production and use toward economic development. Three state educational institutions (University of Michigan, Michigan State College, and Michigan College of Mining and Technology) and two state departments (Michigan Department of Conservation and Michigan Department of Economic Development) are actively involved in the industrial application of forest-products research results. The efforts of all these Michigan agencies are co-ordinated and reviewed by industrial representatives. E.S.

GRAY, D. W. Reproduction following the cutting of a pure jack pine stand. Pulp Paper Mag. Can. 51, no. 1: 104, 106, 108 (January, 1950).

Since it was found that conventional operating practices do not result in adequate natural reproduction of jack pine areas, experimental work was

begun by the KVP Company Ltd., in 1948, to solve this problem. Six experimental cutting areas were established, and the treatment of each is described. To date, germination has been unsatisfactory in all cases, but more successful results are expected in 1950. Observations thus far support the theory that viable seed on mineral soil will result in satisfactory germination when given suitable conditions of light, moisture, and temperature; it must still be determined what operating methods will meet the minimum requirements. J.A.B.

HILF, HUBERT HUGO. Volume yields of aspen and willow and utilization problems of these species. Das Papier 4, no. 1/2: 1-5 (January, 1950). [In German]

The possibilities and requirements of enlarged poplar and willow plantations in Germany are reviewed; the suitability of these quick-growing species as pulpwood is discussed. 10 illustrations and 2 references. L.E.W.

MCLINTOCK, T. F. Why forest management? Paper Ind. 31, no. 11: 1314-16 (February, 1950).

With reference to forestry conditions and losses from insects and disease in Maine, the author emphasizes the beneficial results which may be obtained from intelligent forest management. Maine forests, in general, have either too many or too few trees, too many overmature trees, too many small trees, too little reproduction, and too many weed species. It is time that forest management is put into effect as an active program by industrial policy makers, who must be willing to finance the early stages of the program. Expanded research in the field of forest management by all interested state, federal, and private agencies, and an intensified educational program aimed at the small woodlot owner are urgently needed. E.S.

PATTERSON, A. E. A brief examination of the forest resource of Georgia. Southern Pulp Paper Manuf. 13, no. 2: 24, 26, 28 (February, 1950).

Present forestry conditions in Georgia are outlined, where two out of every three acres are forest land and are supporting a forest crop. State and federal agencies own only 4.3% of the forest land, which leaves 95.7% under private control; only 25.7% of the 25,000,000-acre total are in holdings of more than 1000 acres. A comparison of the two forest surveys in 1936 and 1946 shows that the total board-foot volume of wood in trees of sawtimber size decreased by 13% during this period, whereas the pine cordwood volume increased by 11% and the hardwood cordwood volume by 5%. In addition, Georgia maintains the largest tree planting program of any state. In 1949, 50 million seedlings (sufficient to plant 50,000 acres) were produced, and the demand exceeded the supply. Foresters in Georgia are optimistic and feel no cause for alarm with regard to an impending timber famine. E.S.

SMITH, B. J. Silvicultural work at the Sault Ste. Marie division. Pulp Paper Mag. Can. 51, no. 1: 112, 114, 116-8 (January, 1950).

A report is given on the silvicultural work which has been carried out to date at the Sault Ste. Marie Division of the Abitibi Power & Paper Co. Ltd. An outline is given of projects on permanent sample plots at Carp Creek and Bouchard Lake, nursery work on the St. Mary's River, and forest plantations at Goulais River and Agawa River. Some of the results with spruce and pine are given in table form. 3 tables. J.A.B.

WALTON, J. R. Regeneration and growth on cut-over lands, Lake St. John region. Pulp Paper Mag. Can. 51, no. 2: 80-2, 84 (February, 1950).

A general over-all picture of the regeneration of a region on the Shipshaw River, a tributary of the Saguenay River, Que., is given, which is reasonably representative of this area as a whole. It was cut over (clear cutting) for pulpwood during the past 25 years. The area has been sampled by the usual strip method, with plots taken at intervals along each strip line. The results indicate that the cutover areas are well stocked with spruce, and that fir regeneration and growth appears to be better than in the noncut areas. The data illustrate that the cutting method is not detrimental to the forests in this region, although it cannot be stated definitely that it is the best method from a silvicultural point of view. E.S.

FUEL

YOUNG, R. S., MACDONALD, J. S., and DOUGLAS, W. B. Wood firing in pulverized-coal units. Power 94, no. 2: 117, 162, 164, 166 (February, 1950).

Coal shortages in the copper-producing area of Northern Rhodesia in Africa forced several mining companies to supplement their meager fuel supplies with native hardwoods. The temporary conversion of modern pulverized-coal furnaces for wood burning presented unusual problems. The experiences of two of these companies are described; they included experiments with several grate constructions and problems of charcoal burning and slag removal. The data indicate that handling difficulties and the large amount of hand labor required make the operations uneconomical, except in emergencies. An ash analysis of the wood species used is included. E.S.

GROUNDWOOD PULP

KLEMM, KARL HEINZ. Groundwood and chemical wood pulp as basic raw materials in paper manufacture. Das Papier 4, no. 1/2: 6-16 (January, 1950). [In German]

Recognizing the present fibrous raw-material shortage in Germany, the author outlines the conditions under which carefully controlled groundwood production may serve to save at least one seventh of the wood requirements of the paper industry. The properties of individual groundwood and chemical pulp fibers, their behavior during sheet formation, and the possible substitution of groundwood for chemical pulp are discussed. A table shows the savings that may be effected in the production of newsprint, book, writing, drawing, wrapping, and other papers, and board by the introduction of varying amounts of groundwood. Such substitutions, however, would require that grinding processes be more fully controlled and that mechanical pulp of standardized quality be produced. The ratio of long fibers to fine stuff must be carefully regulated so as to obtain optimum pulp quality. The effects of changing this ratio on paper properties (breaking length, tear, wet strength, folding endurance, etc.) were studied, and the results are shown in separate graphs and summarized in a single schematic chart. 7 tables, 13 figures, and 15 references. L.E.W.

GUAR

PALMER, K. J., and BALLANTYNE, MERLE. The structure of (I) some pectin esters and (II) guar galactomannan. J. Am. Chem. Soc. 72, no. 2: 736-41 (February, 1950).

The small angle diffraction from pectin acetate, propionate, butyrate, laurate, myristate and palmitate esters is recorded. The increase in interchain separation per carbon atom in the ester chain is 0.78 A. This has been interpreted to indicate that the aliphatic chains are perpendicular to the plane of the pyranose rings and make an angle of 35° with the polygalacturonide chain axis. The measured densities of the esters are in good agreement with densities calculated on the assumption that the volumes of the pectinic acid and aliphatic acids are additive. A method is described for producing highly oriented films from the galactomannan obtained from guar. The x-ray diffraction investigation of these oriented films shows that the galactomannan chains have a fiber identity period of 10.3 A. A polymannose chain with side chains of one galactose unit on every second mannose unit is in best accord with the x-ray data. The chains appear to be arranged in sheets with all of the side chains in one sheet pointing in the same direction, while adjacent sheets have the side chains pointing in the opposite direction. The chains are randomly distributed with regard to chain direction. When the moisture content is 16.5% of the dry weight, an orthorhombic unit cell with $a = 15.5$ A., $b = 10.3$ A., and $c = 8.65$ A. satisfactorily accounts for all of the observed x-ray reflections. The density is 1.44 g./cc. when the water content is 16.5%, and therefore there are six hexopyranoside units in this orthorhombic unit cell. The unit cell size is given for water contents of 0, 16.5, and 48%. 3 tables, 4 figures and 18 footnotes. E.S.

SWANSON, JOHN W. Conversion of mannogalactan mucilages in aqueous borax solutions for use as tub-sizing and coating adhesives. Tappi 33, no. 2: 77-81 (February, 1950).

The effect of borax upon guar and locust bean gum for their conversion into suitable papermaking materials was investigated. Several of the converted products were evaluated as tub-sizing and clay-coating adhesives in laboratory- and mill-scale trials with encouraging results. 6 tables and 2 diagrams. E.S.

GUMS AND RESINS

HIRST, E. L., HOUGH, L., and JONES, J. K. N. The structure of *Sterculia setigera* gum. Part I. An investigation by the method of paper partition chromatography of the products of hydrolysis of the gum. J. Chem. Soc.: 3145-51 (December, 1949).

Sterculia setigera gum, a partly acetylated acidic polysaccharide, has been shown to consist of the following sugars in the approximate proportions indicated: D-galactose (5 parts), L-rhamnose (5 parts), D-tagatose (1 part), D-galacturonic acid (8 parts), and traces of two other sugars. Partial hydrolysis of the gum gave a mixture of reducing sugars and a stable acidic portion (*A*) (equivalent weight, 234); methylation of (*A*), followed by fractional distillation in a high vacuum, gave a complicated mixture of oligosaccharides which, on hydrolysis, yielded 3,4-dimethyl L-rhamnose, 2,3,6-trimethyl D-galactose, 2,3,4-trimethyl D-galacturonic acid, and 2,4(or 3,4)-dimethyl D-galacturonic acid. The significance of these results is discussed. E.S.

JONES, J. K. N. Cherry gum. Part III. An examination of the products of hydrolysis of methylated degraded cherry gum, using the method of paper partition chromatography. J. Chem. Soc.: 3141-5 (December, 1949); *cf.* B.I.P.C. 18: 165.

Methylated degraded cherry gum yields on hydrolysis a mixture of methylated sugars which have been separated by means of partition chromatogra-

phy on a column of cellulose. After separation, 2,3,4-trimethyl and 2,4-dimethyl D-xylose, 2,3,4,6-tetramethyl, 2,4,6-trimethyl, 2,4-dimethyl, and 2,6-dimethyl D-galactose, 2,3,4-trimethyl and 2,3-dimethyl D-glucuronic acid were identified. Two unidentified sugars, probably derivatives of mannose, were also separated. Oxidation of cherry gum with periodate results in destruction of the xylose and of about half of the arabinose; the galactose is unaffected. The significance of these results is discussed. E.S.

HISTORY

ANON. Antique papermaking. Papetier 3, no. 11: 31, 33 (November, 1949). [In French]

Following a brief reference to the papermaking raw materials used by the Chinese, Egyptians, and Arabs, the introduction of the art into Sicily and Spain is mentioned. The different versions of its spread to France are discussed. Some claim that returning crusaders brought the knowledge of papermaking from the Holy Land; others believe that the first papermakers came across the Pyrenees to France, and still others consider that the art spread from Italy. The first French paper mills were established at the beginning of the 14th century; the oldest known French watermark dates from 1326. E.S.

ANON. Brief history of the business card. Papetier 3, no. 11: 49, 51, 53 (November, 1949). [In French]

The use of business cards in France as an early advertising medium from the beginning of the 17th century to the middle of the 19th century is discussed. Modern advertising methods have now replaced the old artistic business cards with their decorations and messages or reduced them to plain address cards. E.S.

ANON. The evolution of the envelope. Paper & Print 22, no. 4: 419-20 (Winter, 1949).

The history of the envelope is traced from about the middle of the first century B.C. in China to the present. The postal reform in England in 1840 marked the first use of envelopes in that country. 4 illustrations. J.A.B.

ANON. Paper makers' patron saint; unique window dedicated to Saint Anthony, patron saint of Vosges papermakers. Paper & Print 22, no. 4: 337-9 (Winter, 1949); *cf.* B.I.P.C. 19: 848.

This is the same as the previous reference, except for a colored reproduction of the stained glass window, with an explanation of each individual pane. J.A.B.

KAZMEIER, A. W. Problems of early papermaking in Central America and of present-day watermark research. Das Papier 3, no. 23/24: 458-61 (December, 1949). [In German]

With reference to Von Hagen's book "The Aztec and Maya papermakers" and previous sources of information, the author discusses first the gaps and controversies in the knowledge of early papermaking in Central America. The second part of the article is devoted to the value of watermark research, available sources in European literature, and present activities in Germany. The establishment of a central collection of watermarks is planned. Examples of applications of watermark studies to the solution of different problems are given. E.S.

H-ION CONCENTRATION

CHAPLIN, ALLEN L. Some application factors affecting the regulation of pH in industry. Instruments 22, no. 7: 579-87, 608-10, 612, 614; no. 8: 680-1, 734, 736, 738, 740, 742, 744, 746, 748; no. 9: 804-6, 838, 840, 842-4, 846, 848, 850, 852, 854; no. 10: 910-11, 950, 952, 954; no. 11: 1010-11, 1040, 1042, 1044, 1046; no. 12: 1107, 1138, 1140, 1142 (July-December 1949); 23, no. 1: 38, 86, 88, 90, 92, 94; no. 2: 152, 194, 196, 198, 200, 202 (January, February, 1950).

Following a brief introduction of the theoretical aspects of pH control, with particular reference to control rate characteristic, buffer index, acidity characteristic, and equilibrium lag, the author discusses in separate chapters the residence system, the electrodes and sampling system, process lags, some typical and improved pH control installations, the pH regulator, the graphical determination of approximate throttling-range adjustments, the reagent feed device, and the reagent (liquid, gaseous, and solid reagents). Among the many examples of a general and specific nature listed, several refer to the pulp and paper industry (equilibrium lag of sand trap, paper-machine screens, and the paper machine, p. 586, 608; measuring pH of bleach stock, p. 838, 840, 842-3; typical pH control on paper machine, p. 1010-11; experimental studies on pH control of pulp digesters, p. 1042, 1044, 1046; etc.). 94 diagrams. E.S.

INSTRUMENTATION

BROWN, R. M. Some considerations in the application of instruments to the pulp and paper industry. Instruments 23, no. 2: 144-50 (February, 1950).

Following a brief outline of the mechanical and chemical pulping processes, the author discusses the application of instruments to acid making, cooking, flow control in stock lines, metering of stock, consistency control, bleaching, and air-supply systems. 22 figures. E.S.

YOUNG, J. D. Application of instruments and control to the kraft recovery furnace. Pulp Paper Mag. Can. 51, no. 2: 61-3 (February, 1950).

The author discusses the instrumentation applied to the kraft recovery furnace under the three headings: preparation and measurement of input quantities, measurement of produced quantities, and methods of regulating the various factors to maintain maximum chemical and combustion efficiency. E.S.

JUTE

CALLOW, H. J., and SPEAKMAN, J. B. The action of light on jute. J. Soc. Dyers Colourists 65, no. 12: 758-63; discussion: 763 (December, 1949).

When jute is exposed to light and air, all the principal components undergo degradation. An aqueous extract of the exposed material contains reducing substances, which may be aldehydes of low molecular weight derived from the cellulose by main chain fission, because the copper number of jute is increased by exposure. In addition, the aqueous extract is more acid than that from unexposed jute. Part of the acid seems to come from degraded polyuronides, and the remainder from the lignin, which loses methoxyl groups during irradiation. Their loss may lead to the formation of *o*-diphenols and,

ultimately, *o*-quinones. These seem to be the principal causes of the discoloration which jute suffers during exposure to light and air. In the light of these observations, it seemed probable that discoloration would be prevented by methylation or acetylation. Jute is bleached by treatment with diazomethane, but subsequent discoloration during exposure, though minimized, is not entirely prevented. Better results were obtained by first bleaching jute with sodium hypochlorite and hydrogen peroxide, and then acetylating with a mixture of acetic anhydride, xylene, and sulfanilic acid under reflux. Acetylation for three hours gives a product which bleaches during irradiation, but some discoloration takes place during acetylation. When, however, the jute is treated for only one hour, the primary discoloration is minimized, and the degree of acetylation is such that neither discoloration nor bleaching takes place during exposure. The bleaching of highly acetylated jute during irradiation is favored by the presence of oxygen and water. Acetyl groups are lost during exposure, and it seems probable that bleaching is caused by the formation of acetyl peroxide, which was shown to be capable of bleaching acetylated jute. 14 tables and 14 references. E.S.

KRAFT PULP AND PAPER

BROWNING, B. L., and BAKER, PHILIP S. The characteristics of unbleached kraft pulps from western hemlock, Douglas fir, western red cedar, loblolly pine, and black spruce. IV. The specific surface areas of the pulps and the changes on beating. Tappi 33, no. 2: 99-101 (February, 1950).

When the specific surface areas and physical characteristics of the five pulps were measured after five and 50 minutes of beating, respectively, the pulps having the lowest bursting strength values were those showing the lowest specific surface areas. In fact, it was possible to arrange the five pulps in order of increasing surface for the same beating times and have the resulting order hold for increasing bursting strength values. Arranged in order of increasing specific surface and bursting strength, the pulps are: fir, pine, hemlock, spruce, and cedar. Both bursting and tensile strength values show a relationship to surface area independent of the pulp being tested, although the present data are insufficient to determine the exact relationships. It seems reasonable to conclude that one reason why both pine and fir pulps display low bursting strengths is the low specific surface areas shown by beaten pulps of those species. 2 tables, 2 figures, and 2 references. E.S.

CLARK, G. L. The characteristics of unbleached kraft pulps from western hemlock, Douglas fir, western red cedar, loblolly pine, and black spruce. VI. The orientation of cellulose chains in pulp fibers as measured by X ray diffraction. Tappi 33, no. 2: 108-10 (February, 1950).

An x-ray diffraction method for evaluating quantitatively the type and degree of orientation of cellulose crystallites was applied to pulps of the five woods under study. A modification of the procedure gave significant results; the order of decreasing preferred orientation was Douglas fir, spruce, cedar, hemlock, and loblolly pine. 3 figures and 1 reference. E.S.

GRAFF, JOHN H., and ISENBERG, IRVING H. The characteristics of unbleached kraft pulps from western hemlock, Douglas fir, western red cedar, loblolly pine, and black spruce. II. The morpho-

logical characteristics of the pulp fibers. Tappi 33, no. 2: 94-5 (February, 1950).

Data are given for the fiber length and width of unbleached kraft pulps for western hemlock, Douglas fir, western red cedar, loblolly pine, and black spruce. 1 table and 1 diagram. E.S.

HEUSER, EMIL, SHOCKLEY, WILLIAM, and KJELLGREN, R. The characteristics of unbleached kraft pulps from western hemlock, Douglas fir, western red cedar, loblolly pine, and black spruce. V. A study of the distribution of the degree of polymerization of the cellulose in the kraft pulps. Tappi 33, no. 2: 101-7 (February, 1950).

The average chain length and the chain-length distribution have been determined for western hemlock, western red cedar, Douglas fir, eastern spruce, and loblolly pine kraft pulps by methods involving fractionation by solvent extraction. The results show that eastern spruce pulp closely resembles Douglas fir pulp, and that loblolly pine pulp is similar to pulps from western red cedar and western hemlock. The limitations of the method of fractionation by solvent extraction are pointed out. More recent work favors the fractional precipitation technique, particularly in the upper D.P. regions. 10 tables and 7 figures. E.S.

HOLZER, W. F., and BOOTH, K. G. The characteristics of unbleached kraft pulps from western hemlock, Douglas fir, western red cedar, loblolly pine, and black spruce. III. The comparative pulping of the woods. Tappi 33, no. 2: 95-8 (February, 1950).

Five wood species were pulped by the Central Research and Technical Department of Crown Zellerbach Corp. in the study of pulpwoods carried out in conjunction with The Institute of Paper Chemistry. Both kraft and sulfite pulps were prepared from Douglas fir, western hemlock, western red cedar, eastern black spruce, and loblolly pine. The selected logs were hand-barked and chipped in commercial chippers, then air dried. Kraft cooks were made in an experimental rotary digester to a TAPPI permanganate number of 30. Hemlock was the slowest pulping species, whereas eastern spruce pulped quite easily. The other three species were intermediate, and quite close in ease of pulping. Hemlock, spruce, and pine yields were quite similar, whereas fir and cedar gave much lower yields. Eastern spruce had shorter fibers than the other four species which were quite similar in fiber classifications. Cedar pulp gave the highest bursting strength, followed closely by spruce and hemlock, with Douglas fir and loblolly pine giving much lower values. The order of decreasing tear resistance was substantially the reverse of the bursting strengths. The sulfite pulps were prepared in an experimental digester fitted for forced circulation and indirect heating. Calcium-base acid was used for cedar, hemlock, and spruce, but sodium-base acid was necessary for the other species to prevent burning. Higher temperatures and longer cooking cycles were needed for cedar and Douglas fir to obtain pulps with TAPPI permanganate numbers of 15. Yields of pulp were substantially the same. Fiber classifications were similar for all pulps, except the shorter fibered spruce. The orders for decreasing bursting and tear strengths were nearly the same as in the kraft cooks. Hemlock and eastern spruce are the only two of these five species normally used in sulfite pulping; the other three species produced quite dark pulps in these cooks. 6 tables and 4 figures. E.S.

HOLZER, W. F., and LEWIS, HARRY F. The characteristics of unbleached kraft pulps from western hemlock, Douglas fir, western red cedar, loblolly pine, and black spruce. VII. Comparison of springwood and summerwood fibers of Douglas fir. Tappi 33, no. 2: 110-12 (February, 1950).

Springwood and summerwood of Douglas fir were separated by hand methods and cooked separately by the kraft process. Springwood pulp is characterized by a high bursting strength, low tear, and considerable cutting of the fiber in beating. Summerwood pulp is characterized by a low bursting strength, high tear, and only mild fibrillation in beating. Specific surface of springwood pulp is initially quite high, changes very little on beating during most of the cycle, and then increases rapidly toward the end. Summerwood pulp has a low specific surface initially which increases regularly with beating and rapidly at the end of the cycle to values higher than those of springwood. 2 tables, 2 figures, and 2 references. E.S.

LEWIS, HARRY F., WISE, LOUIS E., and BROWNING, B. L. The characteristics of unbleached kraft pulps from western hemlock, Douglas fir, western red cedar, loblolly pine, and black spruce. I. The chemical constituents of the unbleached kraft pulps. Tappi 33, no. 2: 92-4 (February, 1950).

In this first paper of the series devoted to a better understanding of possible causes for the differences between the physical properties of the kraft pulps from Douglas fir and loblolly pine on the one hand, and from western hemlock, black spruce, and western red cedar on the other, a study of their chemical components is described. The results fail to show significant chemical variations which might account adequately *per se* for the differences in physical properties. Some variations in composition have been shown, as might be expected. The spruce pulp, for example, shows the lowest corrected α-cellulose content; on a corrected basis, western hemlock and Douglas fir pulps have almost identical α-cellulose contents. The lignin contents are approximately the same, confirming that about the same degree of delignification was achieved in the cooking of each wood. Spruce and fir pulps had similar mannan contents, with hemlock intermediate. In the case of the fir pulp, the mannan was found almost entirely in the α-cellulose fraction. Fir and hemlock pulps had much the same uronic anhydride contents. These same pulps had the lowest pentosan (xylan) contents. 4 tables and 3 references. E.S.

LIGNIN

ENKVIST, TERJE, and MOILANEN, MAURI. Ethanolamine-hydrosulfide as solvent for sprucewood lignin. Svensk Papperstidn. 52, no. 23: 587-8 (Dec. 15, 1949). [In German; English and Swedish summaries] *cf.* B.I.P.C. 20: 321-2.

Monoethanolamine saturated with hydrogen sulfide dissolves the major portion of sprucewood lignin at 100° C., and lesser quantities of the wood polyoses than monoethanolamine or ethylene diamine without the addition of hydrogen sulfide. The dissolved lignin combines with a considerable amount of ethanolamine; the low methoxyl content indicates that part of the methoxyl groups have been split off. The nitrogen content of precipitates obtained from the waste liquors differentiates them from the nitrogen-free

products obtained with pyridine and hydrogen sulfide in previous experiments (*cf.* B.I.P.C. 19: 242-3). 2 tables and 8 references. E.S.

LINDGREN, BENGT O. Substituted benzyl alcohols as lignin models. II. Acta Chem. Scand. 3, no. 9: 1011-20 (1949). [In English] *cf.* B.I.P.C. 18: 838-9.

Vanillyl alcohol, veratryl alcohol, apocynol, and 3,4-dimethoxy-α-phenethyl alcohol, which were found to be the best lignin models available, were studied with respect to their sulfite cooking at different pH, sulfite cooking in the presence of resorcinol, and polymerization reactions. Experimental data are included. 2 tables, 1 diagram, and 12 references. J.A.B.

RICHTZENHAIN, HERMANN. Enzymatic experiments dealing with the formation of lignin. IV. Dehydrogenations in the guaiacol series. Chem. Ber. 82, no. 6: 447-53 (December, 1949); *cf.* B.I.P.C. 19: 553.

In the oxidative condensation of phenylpropane derivatives by means of mushroom oxidase, either a nucleus-nucleus combination takes place with the formation of diphenyl derivatives, or a nucleus-side chain condensation occurs with the formation of polymeric compounds. 4-Methyl-, 4-ethyl-, and 4-propylguaiacol and dihydroconiferyl alcohol give diphenyl derivatives. Guaiacylacetone, ferulic acid, and dihydroferulic acid give high-molecular weight products which are oxidatively decomposed according to Freudenberg and co-workers, giving veratric, dehydrodiveratric, isohemipinic, and succinic acids. 10 references. F.E.B.

SCHUBERT, WALTER J., and NORD, F. F. Investigations on lignin and lignification. I. Studies on softwood lignin. J. Am. Chem. Soc. 72, no. 2: 977-81 (February, 1950).

The net effect of the action of the wood-destroying fungi, *Lentinus lepideus, Poria vaillantii,* and *Lenzites sepiaria* on white Scots pine- and white firwoods is a depletion in the cellulose composition of the wood, together with a concomitant increase in the relative content of lignin. After seven months of decay by *Lentinus lepideus* there is approximately a twofold increase in the yield of alcohol-extractable lignin from the decayed wood in relation to that obtained from sound wood of the same species. The native lignin of white Scots pinewood, and the lignin liberated from this wood by enzymatic degradation of the wood cellulose appear to be identical. Data are presented which indicate that native lignin is a chemical entity which is identical in various species of softwoods. Lignin preparations isolated with 70% sulfuric acid, fuming hydrochloric acid, or 10% sodium hydroxide do not resemble native lignin in chemical composition nearly as closely as the lignin obtained after enzymatic decay of the wood. A possible mechanism of lignification is discussed. 20 references. E.S.

UENO, KEISUKE. Manufacture of pulp by the calcium hydrosulfide process. III. Hydrosulfide lignin. J. Japan. Tech. Assoc. Pulp Paper Ind. 3, no. 6: 10-14, 50 (November, 1949). [In Japanese; English summary]

A study of a refined hydrosulfide lignin which had been separated from waste liquor revealed a larger hydrosulfide content and a smaller methoxyl content than would be found in an ordinary sulfite lignin. 4 figures, 4 tables, and 8 references. E.G.S.

LUBRICATION AND LUBRICANTS

PYKE, BRIAN R. Centralised lubrication in the paper-making industry. World's Paper Trade Rev. 133, no. 3: 148, 152, 154, 157-8 (Jan. 19, 1950).

The author discusses the two basic types of centralized lubrication systems: the circulating and the total-loss lubrication. In the first, the lubricant returns eventually to its original starting point, whereas in the second, it is not recovered. Applications to paper-mill machinery and the advantages of centralized lubrication are discussed. 6 illustrations. E.S.

MACHINERY—BEATERS

ABELE, WILHELM. Basalt lava; its significance for the paper, strawboard, and corrugated board industry. Das Papier 3, no. 21/22: 434-5 (November, 1949). [In German]

The introduction of a crystalline variety of lava into industry permits the production of beater knives with narrow beating surfaces and sharp edges. Its usefulness in the strawboard industry is discussed, as well as its suitability for leather, hemp, and flax waste, jute, bagasse, bamboo, etc. L.E.W.

BRECHT, W., and MÜLLER-RID, W. The roller mill. Das Papier 3, no. 23/24: 466-9 (December, 1949). [In German]

This experimental beater, which was developed at the Institut für Papierfabrikation at Darmstadt in 1942, consists of a roll revolving within an outer revolving drum; the details of the construction are described. The beater, which holds 1.5-1.8 kg. of dry pulp, may be operated at various speeds, and pulps may be refined under various pressures and at varying stock densities. The effects of these variations on the beating degree, breaking length, tear-through, burst, elongation, and folding endurance *vs.* time of a bleached sulfite pulp are shown graphically; power consumption is discussed briefly. The similarity of the construction and operating principles of the beater with those of Stephansen's P.F.I. mill is pointed out (*cf.* B.I.P.C. 19: 107-8). 11 figures and 2 references. L.E.W.

HARTIG, CHARLES R. A. Modern methods of stock preparation. Das Papier 3, no. 23/24: 461-5 (December, 1949). [In German]

An illustrated description of the Hydracycle system is given, as applied to the re-use of waste paper (*cf.* abstract below). 5 tables and 8 figures. L.E.W.

PETERSON, F. T. Advance of the stock preparation system in paper making process. World's Paper Trade Rev. 133, no. 5: Tech. Sup. 9-19 (Feb. 2, 1950).

This is an illustrated description of the Hydrapulper, Hydrafiner, cycling chests, jordans, and various combinations of these units for either batch or continuous operation; balanced treatment of the papermaking fibers is also discussed. The subject has been treated in numerous U. S. publications (for example, *cf.* Vokes, B.I.P.C. 15: 131; 16: 505-6; Agronin, B.I.P.C. 18: 756-7; White, B.I.P.C. 20: 22; etc.). 18 figures. E.S.

MACHINERY—CONVERTING MACHINERY

ANON. Adjustable cartoner. Modern Packaging 23, no. 6: 80-4, 186, 188 (February, 1950).

To solve the cartoning problem of companies which manufacture a wide range of products of many sizes and shapes, a semiautomatic machine has been developed which can be changed over from one size to another quickly and without the use of tools. Priced at less than $6000, it will do virtually everything done by the more expensive, fully automatic machine, except that the contents must be loaded by hand. Cartons are automatically fed by a vibratory feed, formed, held open for the load, closed, and discharged at a speed which may reach 120 cartons per minute and is limited only by the speed of the operator inserting the contents. A magnetic clutch actuates the machine and is adjusted to slip on the slightest overload, as a safety measure. The one-horsepower electric main motor is equipped with a variable-pitch pulley which closely controls the machine speed. 12 illustrations. J.A.B.

ANON. Modern Vancouver plant of Canadian Boxes Limited. Can. Pulp Paper Ind. 3, no. 2: 10-12, 34 (February, 1950); *cf.* B.I.P.C. 19: 332.

An illustrated description is given of the converting machinery installed in the container factory of Canadian Boxes Limited in Vancouver. The plant, a subsidiary of Pacific Mills Limited, manufactures corrugated board from paper shipped from the Ocean Falls mill, and corrugated and solid fiber containers. 11 illustrations. E.S.

ANON. Spot the box blank—the rest is fully automatic. Shears 68, no. 686: 10-12 (February, 1950).

The Alpha-Autofeed, a new semiautomatic machine developed by the High Production Machine Co., Philadelphia, for use in the paper box plant of E. E. Fairchild Corp., Rochester, has been called the most marked improvement for the average setup paper box manufacturing plant since the invention of the wrapping machine. The spotting of the stayed box on the glued wrap is the only manual operation; the rest is fully automatic. An automatic feeding unit is closely coupled to the wrapping machine and driven directly from the main drive shaft of the wrapper, thus achieving automatic synchronization. The entire unit is electrically controlled. The machine is economical and labor-saving, even when used for small runs, and it can be changed from one size to another in a few minutes. The average output is 16,000 pieces per day, twice as much as with old style wrapping machines. 4 illustrations. J.A.B.

MACHINERY—CUTTERS

PAPER SALES. Paper cutters: a product everyone needs. Paper Sales 10, no. 2: 11-12, 40, 42 (February, 1950).

Every user of paper in rolls is a prospective buyer of paper cutters, and the paper salesman should be prepared to advise his customers as to the types of cutters suitable for their particular needs. In question-and-answer form, helpful information is given about cutters, such as the styles and sizes available, the kinds of paper accommodated, types of cutting blades, and mountings. The fact that cutters are economical, neat, safe, and save time and space are basic sales points. 10 illustrations. J.A.B.

MACHINERY—DRIVE

PACKARD, ROLAND A. Mill engineers' selection of the paper machine drive. Tappi 33, no. 2: 49-56 (February, 1950).

A brief description is given of the paper machine of 100 years ago. In those early days it was recognized that constant speed was of the greatest

importance, but papermakers could not obtain it. Three so-called "rates of motion" were sufficient—high, medium, and low. In order to minimize the "great quantities of paper destroyed" caused by uneven and changeable speeds required of the different sections of the machine, pieces of felt properly smeared with lagging wax were either applied or torn off. The Marshall train, introduced in 1890, made it possible to double machine speeds. When these speeds attained 600 ft./min., the increased power demand roughened the wooden teeth on bevel gears, which action developed vibrations which were transmitted to horn couplings, thence to rolls and machine frames. At that time the V-belt made its appearance in power transmissions so that short center application made it adaptable for drives. The hydraulic drive, together with the hypoid and spherical bevel gears, made their debut with the flat-belt cone-pulley combination. A description is given of each together with relative merits. Machine widths, speeds, and horsepower again began to tax the engineer's ingenuity, which resulted in the individual motor on each section of the machine. This was a direct-current unit connected to a synchronous motor. All these motors were tied together electrically. Next came the synchronous regulators followed by amplified electronic systems of control. The development of yardsticks for the mill engineer is shown with a series of graphs relative to speed ranges for different groups of papers and a general selective guide for type of machine drive. The approximate cost per horsepower for different types of drive is given, together with the outstanding features of each type of drive. 14 figures. E.S.

MACHINERY—DRIVE, ELECTRIC

ANON. BTH installation in Tasmanian mill. Paper-Maker (London) 119, no. 1: 23 (January, 1950); World's Paper Trade Rev. 132, no. 24: 1599 (Dec. 15, 1949).

Seven 2500-h.p. synchronous motors have recently been supplied by British Thomson-Houston to Australian Newsprint Mills Pty. Ltd. for driving pulp grinders. 1 illustration. E.S.

MACHINERY—FELT CONDITIONERS

ANON. The Vickery felt conditioner. Papeterie 72, no. 1: 9, 11, 13, 15 (January, 1950). [In French]

The construction and advantages of the Vickery felt conditioner are described (French patent 952,832, issued May 9, 1949). 2 illustrations. L.E.W.

MACHINERY—FELTS

MILNES, S. W. The manufacture of fine paper machine felts. Pulp Paper Mag. Can. 51, no. 2: 59-60 (February, 1950).

The author covers the most important factors and variables in the manufacture of fine paper-machine felts, from the selection of the raw wool to the amount of nap that goes into felt design. Of the many different designs of felts, those for the production of fine papers are the most difficult to make, because of the constant changes in the type of paper which must be run on the same machine clothed with the same felts. At best a compromise felt results, which will give the most satisfaction for each grade of paper to be run. Some of the desirable properties, such as strength and porosity, or porosity and finish, etc., are not compatible and the properties of primary importance must receive first consideration at the expense of those of lesser significance. E.S.

MACHINERY—HEAD BOX

MCARN, THEODORE A. The Downingtown approach flow system. Yearbook Am. Pulp Paper Mill Supts. Assoc. 30: 188-9 (1949).

The author describes the Downingtown approach flow system with its stainless steel mix box in two sections and special stock inlet for delivering the stock to the mold of the cylinder machine without flocculation or stratification. Special attention is given to the thorough mixing of stock and white water below the surface to avoid the possible entrainment of air. The mixture is conveyed to a special stock inlet and from there through several passes to the forming board without noticeable turbulence; a level sheet of good formation results. All sections of the assembly are readily accessible for cleaning. E.S.

MACHINERY—PACKAGING MACHINERY

EVANS, L. E. Packaging machinery, an essential to mass production. Fibre Containers 35, no. 1: 62-7 (January, 1950).

A lengthy discussion is given of the types of packaging machinery and their applicability to the various fields of manufacturing. In deciding upon an investment in a packaging machine, a company should consider the length of time which will be required for the piece of equipment to be amortized. If the period will be five years or less, it is warranted; if three years or less is sufficient, the purchase is mandatory. The difference between standard and special machinery is pointed out, the standard being considerably less expensive, but inadequate for some purposes. Special machinery, although expensive, is essential and even economical in many cases. In addition to the three general classifications of packaging machinery (package makers, fillers, and closers), labeling machines, weighing machines, and coding devices are mentioned briefly. J.A.B.

MACHINERY—PAPER MACHINE

GOODWILLIE, J. E. Machine possibilities; "there are no supersonic barriers." Pulp & Paper 24, no. 2: 27, 84, 86 (February, 1950); Pulp Paper Mag. Can. 51, no. 2: 73-6 (February, 1950).

The author shows that no particular section of the paper machine imposes a limitation on higher production rates and good operating efficiency. The present operating speed ranges of paper machines for different types and grades are listed, and the opinion is expressed that these speed ranges can be satisfactorily increased. To indicate the planning necessary for advances into higher speed ranges, the possible improvements in the various sections are discussed, including comments on headbox and inlet design, formation on the Fourdrinier wire with particular reference to the construction of the table rolls, suction couches, presses, the drier section and ventilation, supercalenders, winders and rewinders, and drives. E.S.

MACHINERY—PULPERS

COWLES, EDWIN. Cowles announces new side drive pulper. Paper Ind. 31, no. 11: 1296 (February, 1950); Chem. Eng. 57, no. 3: 140 (March, 1950); Paper Trade J. 130, no. 13: 42 (March 30, 1950); Paper Mill News 73, no. 12: 50, 91 (March 25, 1950).

A new pulper is described, in which a comparatively small, fast-running impeller (200-500 r.p.m.) is mounted on a horizontal shaft at the bottom of one side of a tub departing from the ordinary circular shape. The impeller is partially shrouded by a member which resembles a section of the volute of a centrifugal pump and which collects and directs the discharge from the impeller in a tangential and upward direction, so that good circulation at all

ordinary consistencies results. Fast clean dumping is obtained by providing a very steep slope to the bottom; the lowest point is under the impeller, where a perforated extraction plate is located, through which the stock drains naturally. 1 illustration. E.S.

MACHINERY—PUMPS

ENOKIHARA, S. A study of pulp mill machinery. IX. Pulp pumps. J. Japan. Tech. Assoc. Pulp Paper Ind. 3, no. 5: 38-40, 47 (September, 1949). [In Japanese; English summary]

A graphical explanation is given of the relationship between the pulp consistency, pump efficiency, delivery capacity, and power requirement. 3 figures. E.G.S.

MACHINERY—REFINERS

AESCHBACHER, S. American trends in stock preparation. Textil-Rundschau 4, no. 10: 364-70 (October, 1949). [In German]

The author discusses the disadvantages of the batch operation in the traditional beater with its predominating cutting action upon the fibers. With particular reference to Campbell's theories of cellulose-water relationships, the internal surface of cellulose, and the adhesion of cellulose fibers (*cf.* B.I.P.C. 19: 759), the bruising and combing action of the different types of continuous jordans and disk refiners is considered superior for modern high-speed paper-machine operation. The arrangement of the jordans in parallel or tandem fashion and the possibilities of combinations of the two methods are listed. Continuous stock preparation permits reproducible results on the paper machine and transfers the regulation of the stock-preparation equipment from the beaterman to the machine tender; power consumption is greatly reduced. The testing procedures are chiefly applied to the finished product; the folding-endurance tester, the Mullen tester (for burst), the Elmendorf tester (for tear-through), and the Gurley tester (for porosity and smoothness) measure important printing properties. Another advantage claimed for the new stock-preparation equipment is the fact that mill-scale operations can be exactly duplicated in a small laboratory jordan; this was not possible in a laboratory beater. E.S.

ROBINSON, C. T. Refining of rejects. Pulp Paper Mag. Can. 51, no. 2: 54-8 (February, 1950).

To obtain data on the operation and maintenance of the variety of equipment available for the recovery of coarse groundwood rejects, a questionnaire was submitted by the Mechanical Pulping Committee of the Technical Section, Canadian Pulp and Paper Association, to a fairly representative group of newsprint manufacturers; information on water separators was also obtained. The text of the questionnaire is reprinted; the answers are presented in tabulated form (table I, water separators; table II, refiner operation). The following seven types of refiners are covered in this survey: Jones, Claflin, Canadian Allis-Chalmers, Sutherland, Noble and Wood, Haug, and Bauer. The operation of all these types appears to be reasonably satisfactory; however, maintenance problems are indicated in many cases. 4 tables. E.S.

X. Refining of paper pulp. Papeterie 72, no. 1: 2 (January, 1950). [In French] *cf.* B.I.P.C. 19: 23, 170.

The basic requirements of a refiner are discussed briefly. L.E.W.

MACHINERY—THICKENERS

ANON. The Lindblad filter by Sund-Skönvik. Svensk Papperstidn. 53, no. 1: 14-15 (Jan. 15, 1950). [In Swedish; English and German summaries] *cf.* B.I.P.C. 19: 633.

A new thickener construction, the Lindblad filter, and its operating principle are described. The cylinder drum consists of an outer perforated shell and an inner imperforate shell; the space between the two shells is subdivided into cells which are connected to suction mechanisms inside the drum. The capacity of a filter 2 m. in diameter and 3.5 m. in length is 125 metric tons of unbleached sulfite pulp per day, when the stock enters the filter at a consistency of 0.4% and leaves it at 10%. If the pulp consistency ahead of the filter is increased to 0.8%, the output can be raised to 200 tons per day. 3 illustrations. E.S.

MACHINERY—WIRES

ANON. The manufacture of paper machine wires. World's Paper Trade Rev. 133, no. 2: 72, 74 (Jan. 12, 1950).

A film made at the United Wire Works, Edinburgh, Scotland, is reviewed, which illustrates the different stages of annealing and drawing, weaving, joining the ends, and packing for shipment of Fourdrinier wires. E.S.

ISODA, S. Determination of wire width. J. Japan. Tech. Assoc. Pulp Paper Ind. 3, no. 1: 27-30, 58 (February, 1949). [In Japanese; English summary]

A survey of the types and sizes of paper machines in Japan revealed that there are 120 Fourdrinier machines and 481 cylinder machines in current use; the largest is a 186-inch Fourdrinier machine. In a discussion of wire specifications, it is pointed out that there is an optimum wire width for each of the various types of paper. It is suggested that an allowance be made for the shrinkage of the wet sheet in selecting a wire width. 6 figures and 6 tables. E.G.S.

MARKET RESEARCH

STOKES, DONALD R. The outlook for prepackaged produce. Fibre Containers 35, no. 1: 93-4 (January, 1950); *cf.* B.I.P.C. 18: 846-7.

The vegetable and fruit prepackaging prospects are summarized in table form, with estimates of the relative importance of the principal items, the sources of production, and trends in consumption. The factors affecting the relative potential possibilities for prepackaging various vegetables and fruits are: the need for unitizing loose items, the possibilities for reduction in waste and spoilage, the need for preparation or kitchen servicing, the relative costs of prepackaging and bulk packaging, and the effect of prepackaging on the preservation of quality. The most advantageous point of prepackaging, whether at the source or at the point of sale, is considered. 2 tables. J.A.B.

MATERIALS HANDLING

ANON. A Crashpad for newsprint rolls. Pulp Paper Mag. Can. 51, no. 1: 147 (January, 1950).

The Crashpad, a product of White & Holcombe, San Francisco, uses foam rubber as a cushioning agent and is covered with heavy, strap-reinforced canvas. Its use practically eliminates the breaking of wrappers and distortion

of large newsprint rolls when they hit the deck in shiploading operations. 1 illustration. J.A.B.

IMMONEN, BJÖRN. Transport trucks and their use in the paper industry. Finnish Paper Timber J. 31, no. 21: 386-7, 388-93; no. 22: 427-30, 432-6 (Nov. 15, 30, 1949). [In Finnish; English summary]

A profusely illustrated description of the various types of industrial trucks is given, including platform, lift, fork, crane, scoop, straddle, and hand trucks, Trucktractors, dumpers, bins, skids, and pallets. The use of trucks in the paper industry is discussed, with particular reference to fork trucks. 39 figures and 10 references. E.S.

POTTS, MATTHEW W. Materials handling in pulp and paper mills. Yearbook Am. Pulp Paper Mill Supts. Assoc. 30: 272, 275, 277-8, 280, 283-4, 286, 288, 290, 293-4 (1949).

This is a general discussion of the subject in which several members participated. The original presentation was accompanied by lantern slides. E.S.

MICROSCOPY

MOREHEAD, F. F. Modern microscopy of films and fibers. ASTM Bull. no. 163: 54-7 (January, 1950).

A discussion is given of light, electron, and phase microscopes, accompanied by micrographs which show the effectiveness of each type. The electron microscope is almost 200 times as powerful as the light microscope, and since there is a region of magnification where the two systems overlap, they can be used to supplement each other. Structural differences in the cross section of a fiber may be more easily observed by staining; the "skin effect," for example, is revealed in this way. The phase microscope is a means for detecting slight differences in the optical path in different parts of a specimen. Since the optical path is equal to the thickness times the index of refraction, it is necessary to use very thin specimens. An excellent fiber for this purpose is surface-saponified cellulose acetate. 1 table, 13 photomicrographs, and 7 references. J.A.B.

MICROSCOPY (ELECTRON)

MAKINSON, K. RACHEL. Some replica techniques useful in electron microscopy of the surface of the wool fiber. Textile Research J. 20, no. 1: 22-8 (January, 1950).

Techniques have been developed for making replicas, suitable for examination in the electron microscope, of the surface of the wool fiber without subjecting the fiber to heat or pressure. Electron micrographs are reproduced to illustrate the appearance of normal wool fibers and of fibers subjected to various chemical and mechanical treatments. The results obtained support the view that the scales consist of a smooth layer overlying a more resistant furrowed structure. Certain other features of the scales, including a peculiar "fringed" edge, are also noted. 10 figures and 19 references. E.S.

NEWMAN, SANFORD B. A new technique for cutting very thin sections and its application to the electron microscopy of fibers. ASTM Bull. no. 163: 57-60 (January, 1950).

The application of the electron microscope to many biological and indus-

trial problems has been hampered by the lack of an efficient and inexpensive method for producing sufficiently thin specimen sections. The author describes an improved method, using a copolymer of 80% polybutyl methacrylate and 20% polymethyl methacrylate as the embedding medium. An intricate device for advancing the specimen to the knife utilizes the thermal expansion of a brass block, which is drilled through its main axis to receive a ⅜-inch brass pipe plug. The plug has a hole in its outer face to provide a snug fit for the specimen, which is held in place by a film of rubber-paraffin mixture. A needle valve is inserted in the side of the block. The assembled device is clamped in the jaws of a laboratory microtome, and compressed carbon dioxide is admitted to the hollow block and allowed to expand, lowering the temperature of the block and causing it to contract. When the advancing mechanism is disengaged, the block warms, expands, and carries the specimen forward. At the same time it is stroked past the knife edge by the vertical motion of the microtome. The resulting slices are processed in the usual manner. 6 figures and 7 references. J.A.B.

MILL MANAGEMENT

LIVINGSTONE, R. S. Earning employee backing. Pulp Paper Mag. Can. 51, no. 1: 70-4 (January, 1950).

The essentials of good management are reviewed, so that it can earn and deserve the backing, the support, and the sponsorship of its employees. The typical individual workman is considered the fundamental unit in the field of human relations and the problem is approached by understanding his desires and evaluation of a "good job." E.S.

MONTGOMERY, MARGARET J. The before-and-after hidden profit margin. Southern Pulp Paper Manuf. 13, no. 2: 46, 48 (February, 1950).

In the author's opinion, too much attention is concentrated on the paper machine and too little on the possibilities for savings by the balance of the operations before and after the machine. Examples of possible cost reductions in these two areas are given; the advantages of an outside survey by a consulting management engineer whose point of view is not restricted by habit, lethargy, or procrastination, are emphasized. E.S.

MOTTERSHEAD, EDMUND. How good is your merit rating system? Am. Paper Converter 24, no. 2: 26, 28, 30 (February, 1950).

The importance of an effective merit rating system in every type of organization is emphasized, not only because it provides a means of reviewing the personnel and a basis for promotions and pay increases, but because it has a psychological influence on workers' productivity. The same rating system should be applied to supervisors and junior executives as is used in the case of all other employees, and two or three different ratings should be made of each individual to eliminate the possibility of prejudices. The terminology and standard of rating should be simple and precise to insure uniformity. Some sample merit rating programs are described. J.A.B.

WINSTON, C. C. Maintenance organization and management—principles. Southern Pulp Paper Manuf. 13, no. 2: 48-52 (February, 1950).

The author considers the fundamental principles of maintenance under the 11 headings: equipment records, inspections, lubrications, job orders, planning,

sizing the forces to the job at hand, job order costs, equipment maintenance costs, maintenance stores, salaries and wages, and executive reports. The provision of an organization to operate around these principles is the next logical step. The maintenance superintendent should never be subordinate to the man responsible for production, but should report to the manager at a level parallel with the production manager. The importance of co-ordination of production and maintenance is emphasized. Maintenance costs average nearly 5% of the net sales dollar and, in some instances, run as high as 10%. Substantial reductions are possible in a properly organized maintenance department. E.S.

MOTION STUDIES

MOORE, W. CLEMENT. More profits from motion study and efficient materials handling. Shears 68, no. 686: 30 (February, 1950).

The author points out, as an example of the effect of materials handling improvements that, if 30 seconds could be saved out of every five minutes spent in the movement of materials, a saving of 10% of a 160-man-hour work day would result. Equally startling savings are realized when motion study is put into practice. J.A.B.

NEWSPRINT

NEWSPRINT ASSOCIATION OF CANADA. World newsprint situation. World's Paper Trade Rev. 132, no. 24: 1644, 1646, 1649-50, 1652; no. 25: 1711-12, 1714, 1716, 1718 (Dec. 15, 22, 1949).

The world newsprint situation with regard to supply and demand is discussed, supplemented by tables and charts; the subject is considered in the light of the profound economic and political changes which have occurred following the war. The United States now consumes 60% of the world supply; the dollar shortage resulted in a new postwar pattern. The data are taken from "Newsprint data, 1949," a publication of the Association. E.S.

UNITED NATIONS EDUCATIONAL, SCIENTIFIC AND CULTURAL ORGANISATION. World's newsprint needs. World's Paper Trade Rev. 133, no. 4: 263-4, 266, 269-70, 272 (Jan. 26, 1950).

In this third UNESCO report on technical needs, 1949, in press, film, and radio, newsprint receives detailed attention. Fourteen additional countries were visited, including Finland, Sweden, and Switzerland in Europe. Extracts from the report with regard to the newsprint situation in the three countries are given. E.S.

NOMOGRAPHIC CHARTS

DAVIS, D. S. Loss in head on pumping fibrous suspensions. Paper Ind. 31, no. 11: 1316 (February, 1950).

A nomographic chart is presented from which the loss in head on pumping a fibrous suspension can be determined when the internal diameter of the pipe, stock consistency, and velocity (ft./sec.) are known. The chart can also be used to find the velocity at which a stock of a certain consistency can be pumped in a pipe of a given size so that the loss in head will not exceed a specified value. Examples are given. 1 diagram and 2 references. E.S.

PAPER—COATED

KILLINGER, J. E. Cooked starch. Yearbook Am. Pulp Paper Mill Supts. Assoc. 30: 72, 75 (1949).

The author reviews the different types of starches available to the coating

industry, the effect of chemical additions and the degree of hydration or gelatinization on their properties, the resinification with urea formaldehyde, and recent developments in dextrins which result in products of extreme fluidity and high solubility, particularly suitable for higher base-weight coatings. E.S.

PAPER—SHEET FORMATION

IVANOV, S. N. Look-through in paper. Bumazh. Prom. 24, no. 6: 13-17 (November-December, 1949). [In Russian]

The appearance of a paper when viewed by transmitted light, or look-through, is one of the most significant qualitative indexes of fine papers, and is a good criterion of structural uniformity. There are several factors which affect look-through: the type of beating; the characteristics of the fibers; the presence of sizes and fillers; and the flow conditions on the wire of the papermaking machine (i.e., the consistency of the pulp, its rate of discharge to the wire, shaking, etc.). Fibers of a definite size are necessary for a uniform product; the optimum average fiber length usually lies in the range of 0.7-0.8 to 1.5-1.8 mm. The consistency of the pulp should be 0.2-0.3% for a thin paper, 0.5-0.8% for a paper of 50-80 g./sq.m. basis weight, and 1.0-1.5% for a heavy paper of 120-200 g./sq.m. basis weight. The shake should impart a very rapid, short motion to the wire, so that it can even be used with a high-speed papermaking machine; several arrangements of table-roll shakes are shown schematically. 1 figure. E.G.S.

THODE, EDWARD F. Influence of surface properties of fibers on papermaking. Paper Mill News 73, no. 5: 12, 14 (Feb. 4, 1950).

The author discusses the present knowledge of surface properties of cellulosic fibers (electric charge and surface area) as related to flocculation, sheet formation, sizing, etc., and shows how the application of the principles of certain colloidal phenomena may help in the solution of practical papermaking problems. E.S.

PAPER—VISCO-ELASTICITY

ANDERSSON, OLLE, and STEENBERG, BÖRJE. Paper under impact conditions. Svensk Papperstidn. 53, no. 1: 1-7 (Jan. 15, 1950). [In English; German and Swedish summaries]

The mechanical characteristics of materials under impact conditions are quite different from those observed in ordinary, essentially static testing. Paper is a typically visco-elastic material, exhibiting different characteristics at different rates of straining. In addition, under conditions of high-velocity impact testing, the time of transit of shock waves is not negligible, so that a stress-strain curve for a very high rate of elongation (if it were possible to obtain such a curve experimentally) would be different from such a curve observed under ordinary conditions of testing—quite apart from rheological effects. The authors discuss shock waves through materials for which Young's modulus is constant (Hookean material) and for which the modulus depends upon stress and strain. In a Hookean material the shock wave proceeds with the velocity of sound from the end of a strip to which impact has been applied, reflects from the fixed end, then reflects from the moving end, etc., with the stress building up at any point by steps until the rupture strain of the material is attained. Using impact velocities from 1 to 5 m./sec., the authors have not observed stepwise curves in their work on paper, and attribute the absence of steps to the non-Hookean behavior of paper. They discuss the nature of plastic waves in a visco-elastic material, using an approximation method suggested by von Kármán. Because of the rounded

nature of the wavefronts in such a material, the analysis is very complex. The discussion brings out the facts that (1) the rate of strain of a specimen under impact conditions is not simply related to the rate of elongation, and (2) the elongation at rupture must be less than that in the "fictive dynamic case" (in which inertial effects are neglected). The difficulty of obtaining a stress-strain curve from an observed stress-time curve when rheological aspects are considered is discussed; a graphical trial-and-error method is suggested, but the authors state that the procedure is very tedious. They also state that practical dynamometers are far from ideal in that they do not possess infinite stiffness and inertia. Rupture energy for a specimen tested under impact conditions is next considered; again, the results to be expected are quite different from those predicted from the "fictive dynamic case." For example, uneven stress distribution along the specimen could result in a "weak spot" being subjected to a relatively low stress at the moment of rupture—the specimen would not necessarily fail in its weakest link; the specimen might fail in more than one place (brittle failure or shattering); if the impact velocity is sufficiently high (critical velocity), stress exists only at the impact end where failure occurs, and the rupture energy is very small. von Kármán's expression relating particle velocity in the material with shock-wave velocity and strain yields the critical velocity when the integral of the expression is evaluated to rupture strain. When the impact velocity is equal to, or greater, than this critical velocity, the specimen fails immediately at the impact end. A consequence of the theory is that a specimen will fail at (or above) the critical velocity when the previously fixed end is simply not clamped. The authors believe that the critical velocity is of great theoretical and practical significance. They are currently determining critical velocities with an instrument capable of velocities up to 40 m./sec. They state that the critical velocity for a newsprint sample appears to be about 23 m./sec. (*cf.* also the work by Hamburger, B.I.P.C. 19: 432-3). 7 figures and 5 references. J.A.V.

PAPER AND PULP INDUSTRY

ANON. Canadian market for fine paper products. Paper Market: 148, 150, 152 (December, 1949); World's Paper Trade Rev. 132, no. 24: 1600 (Dec. 15, 1949).

The opportunities for British fine paper products in Canada under present conditions are pointed out, particularly for greeting cards, calendars, stationery, playing cards, gift wrappers, fancy papers, doilies and table goods, etc. The time has never been more favorable for the British manufacturer, because the Canadian standard of living is at the highest level it has ever reached, imports of many paper products from the United States are restricted by quota allocations, and recent changes in the sterling rate have given British exporting firms a decided price advantage. E.S.

DUFFY, M. Paper and print finance 1939-1949. Paper & Print 22, no. 4: 406, 408, 415 (Winter, 1949).

The fluctuations of the industrial markets of the London Stock Exchange during the past ten years may be outlined as follows: a sharp reaction after Dunkirk, a gradual, irregular recovery after the Battle of Britain, a further general rise in the immediate postwar years, and finally, an all-round recession from the highest levels in the years 1948 and 1949. Shares of paper and print companies followed this general trend, as illustrated by a share price table. An interesting comparison is made by contrasting speeches made by chairmen of the various paper companies during the 1939-41 cycle with those of the 1946-49 period. 1 table. J.A.B.

FOWLER, R. M. Canada's greatest breadwinner—the pulp and paper industry. Pulp Paper Mag. Can. 51, no. 1: 67-9 (January, 1950); *cf.* B.I.P.C. 19: 489.

The principal aspects of the Canadian pulp and paper industry during 1949 are reviewed, including the devaluation, newsprint, wood pulp, other papers and paperboard, pulpwood cut, and forests. E.S.

THE NORWEGIAN PAPER MAKERS ASSOCIATION *and others.* The Norwegian paper, pulp, timber, and wallboard industries 1949. Norsk Skogind. 4, no. 1: 4-11 (January, 1950). [In Norwegian and English] *cf.* B.I.P.C. 19: 566.

Conditions in the Norwegian forest-products industries during 1949 are reviewed by their different associations, including production, exports, prices, labor conditions, raw materials, etc. E.S.

ROWE, R. C. A review of British industry. Pulp Paper Mag. Can. 51, no. 1: 66, 69; no. 2: 52, 111 (January, February, 1950); *cf.* B.I.P.C. 20: 413.

In the second part of the article the urgent need for narrowing the dollar gap between Great Britain and Canada is discussed, as well as the possibilities of whether or not Great Britain will be able to carry out her program by 1952, when the United States' aid will be terminated. To investigate two widely broadcast assumptions—that British industry is suffering from obsolescence and present British labor is indolent and inefficient—the Canadian Technical Press Mission (of which the writer was a member) toured the United Kingdom. The third part of the article presents a survey of British plants, labor, and labor-management relations. The author gives a rather optimistic picture of conditions; in his opinion, there can be no doubt that any idea that British industry is bankrupt in either money or methods can be discounted. E.S.

TIPPETTS, E. A. The position of cellulose as a chemical raw material. Tappi 33, no. 2: 32A, 34A (February, 1950).

About 750,000 tons of chemical grade cellulose were produced in the United States in 1949, of which roughly 85% was used for the manufacture of viscose and acetate rayon and cellophane; the tire industry consumed about 25% of the rayon produced. The remaining 15% was used in the manufacture of plastics, smokeless powder, lacquers, fabric coatings, films, etc. With the exception of rayon and cellophane, no continued growth in the future is indicated; as a matter of fact, a decrease in the plastics and miscellaneous fields may be expected. The use of dissolving pulps in the fields of rayon and cellophane will continue to grow for the next several years, largely capitalizing on the technology which has already been developed. A broad fundamental study of pulping technology is urgently needed to hold and expand the volume of chemical cellulose against the low-cost, tailor-made polymers which will inevitably be made available to the fiber and film industries from the rapidly expanding field of basic research on synthetic polymers. As an example of the value of basic cellulose research, the superiority of "Cordicell" for the tire industry is mentioned, a Swedish pulp manufactured by a kraft cook following prehydrolysis, with better properties than those obtained in the best commercially available sulfite pulps. The favorable low-cost position of cellulose will be increasingly difficult to maintain and strengthen as the synthetic-polymer industry develops. E.S.

WORLD'S PAPER TRADE REVIEW. Scandinavian journey. World's Paper Trade Rev. 132, no. 18: 1189-90, 1195-6; no. 20: 1329-32, 1337-40; no. 22: 1473-6, 1481-4; no. 24: 1617-20, 1625-9; no. 26: 1761-4, 1769-72 (Nov. 3, 17, Dec. 1, 15, 29, 1949); 133, no. 2: 101-2, 107-8; no. 4: 241-2, 247-8; no. 6: 381-2, 387-8 (Jan. 12, 26, Feb. 9, 1950).

Several representatives of this British journal visited some well-known organizations in Sweden and Norway; an illustrated account of their trip is presented, covering mills, trade associations, and research institutions in both countries. E.S.

YOWELL, L. Q. Paper merchants see good year ahead. Am. Paper Merchant 47, no. 2: 22-5, 34, 36, 44 (February, 1950).

The results of a survey made of the paper industry indicate that paper merchants are optimistic about the future and expect a gain in business in 1950, with prices remaining relatively stable. The trends in the various sections of the country are discussed. The secretaries of trade associations in both the merchandising and manufacturing fields were also asked for their analyses of 1950 business conditions, and their opinions supported those of the merchants. 1 table. J.A.B.

PAPER AND PULP MILLS

ANON. New pulp and paper mill for Algeria. Paper Trade J. 130, no. 7: 12, 16 (Feb. 16, 1950); *cf.* B.I.P.C. 20: 333.

The installations of the new Cellunaf pulp mill, Algeria, are described. The plant uses the Celdecor-Pomilio process for the digestion of straw and esparto grass; the digested raw material is chlorinated by means of chlorine gas at a pulp consistency of 30%, followed by a second chlorination at a lower consistency; the pulp is then washed and given a high-density alkaline treatment, and finally bleached in two stages with hypochlorite in a Celdecor-Kamyr continuous bleaching plant. The chemicals for digestion, chlorination, and bleaching are supplied from a nearby chemical factory by means of direct pipelines. 2 illustrations. E.S.

ANON. The Price Bros. story; 132 years old and still growing. Pulp & Paper 24, no. 2: 57-9 (February, 1950).

A brief history is given of Price Bros. & Co., one of eastern Canada's biggest pulp, paper, and lumber enterprises. The organization was founded by William Price, who set foot on Quebec soil in 1810, and the Price family has always remained active in its direction. Arthur Clifford Price, the seventh member of the family to head the company, became president in 1948. Price Bros. operate two newsprint and one board mill and several sawmills, all located in Quebec; they own large timberland and power resources. 9 illustrations. E.S.

ANON. Wealth from waste. Indian Pulp and Paper 4, no. 5: 226 (November, 1949).

Reference is made to the construction of a fine paper mill at Dalmianagar in Bihar, India, which will utilize bagasse as raw material. The Celdecor-Pomilio process will be used and the machinery imported from Great Britain. 2 illustrations of processing stages which were also published in Can. Chem. Process Inds. (*cf.* B.I.P.C. 20: 349). E.S.

BURKHOLDER, JOHN A. Provincial Paper's improvement program. Pulp Paper Mag. Can. 51, no. 2: 42-6 (February, 1950).

An illustrated description is given of the modernization program of the four mills of Provincial Paper Ltd. at Mille Roches, Port Arthur, Thorold, and Georgetown, Ont. The improvements, among others, include a new slush sulfite system, a new boiler, and a second machine-coating unit at Port Arthur, Stapley pulpers in place of beaters at Mille Roches and Thorold, a new office wing and extensive rearrangements of the mill floor for straight-line production at the Georgetown coating mill, etc. 1 flowsheet and 14 illustrations. E.S.

DONNELLY, FLORENCE. A fortune from straw. Paper Maker [U. S.] 19, no. 1: 11-17 (February, 1950).

The history of the pioneer South Coast Paper Mill at Soquel, Calif., is traced from its beginning in 1879 to the time when wood pulp supplemented straw as the raw material in papermaking, and the mill was abandoned. The enterprise was begun by Edward and Frank O'Neill, who converted a wool and leather mill into one which manufactured butcher paper from straw; later Charles W. Callaghan also became a partner. So successful was this venture that in 1889, a similar project was started in Lebanon, Oregon; this mill was eventually acquired by Crown Zellerbach Corporation. 11 illustrations. J.A.B.

ELLIOTT, HARRISON. The Gilpin Paper Mill on the Brandywine. Paper Maker [U. S.] 19, no. 1: 25-6 (February, 1950).

In the Gilpin Paper Mill, erected in 1783 by Joshua and Thomas Gilpin on the Brandywine River near Wilmington, Del., the first papermaking machine in this country for making paper in a continuous web was built and successfully operated. This machine was of the cylinder type and produced wider paper than was possible by the hand-mold method, in any length desired. It was claimed that it did the work of ten crews working by the handmade method and produced three reams per hour. Both laid and wove types of paper were made in this mill. It was nearly destroyed by flood in 1838, ending a half century of industry by the Gilpins; the estate was sold and the mill converted to the manufacture of cotton goods. J.A.B.

GARWOOD, JUSTINE. Pulp and paper manufacturing in the United States. Indian Pulp and Paper 4, no. 5: 216-18 (November, 1949).

The sustained-yield policies of the Crown Zellerbach Corp. in the Pacific Northwest are discussed, not only as they apply to forestry conditions, but also to stable employment and good management-labor relations. E.S.

PAPER INDUSTRY. More newsprint for South—Coosa River producing. Paper Ind. 31, no. 11: 1306-13 (February, 1950).

The second newsprint mill in the South at Coosa Pines, Ala., started operations in the middle of January, 1950, ahead of schedule. The mill is designed to manufacture about 350 tons of newsprint per day from semi-bleached kraft and groundwood pulp, and 150 tons of dried, fully bleached kraft pulp for sale. A profusely illustrated description (including a flowsheet) of the mill and its equipment is given. The groundwood mill houses five Roberts grinders. The sulfate mill is divided into two sections from the digester room through the bleach plant and screen room, so that the semi-chemical pulp for newsprint and the fully bleached pulp are handled quite separately. The newsprint sulfate stock is bleached in three stages (low-density chlorination, high-density caustic extraction, and high-density hypo-

chlorite bleach); the fully bleached pulp, on the other hand, is treated in six stages (low-density chlorination, high-density caustic extraction, high-density hypochlorite bleaching, high-density caustic extraction, low-density hypochlorite bleaching, and low-density sulfur dioxide treatment). The two Beloit paper machines are identical, except that one is right hand and the other left hand; each machine is 226 inches wide. Both are driven by multiple-generator sectional drives with electronic amplidyne regulators and designed to operate at top speeds of 1800 ft./min. Complete heating and ventilating systems for the entire mill were supplied by J. O. Ross Engineering Co. Extensive use of instruments and control systems has been made throughout the mill. The officers and administrative staff members of the Coosa River Newsprint Co. and the manufacturers of the important installations and equipment are listed. E.S.

PAPER MILLS NEWS. Coosa River newsprint mill starts production in Alabama. Paper Mill News 73, no. 7: 16-43 (Feb. 18, 1950).

The information is essentially the same as that given in the preceding reference. The present article is interspersed with advertisements of equipment manufacturers who supplied installations for the new newsprint mill. Numerous illustrations. E.S.

PAPER AND PULP MILLS—ELECTRIFICATION

LYNCH, J. C. Electrification of a pulp and paper mill. Tappi 33, no. 2: 73-6; discussion: 76 (February, 1950).

The electrification of a pulp and paper mill which started operations in 1899 is described. With the exception of a few initial years of operation, electric power has been utilized for auxiliary drives from the earliest days of the company's pulp and papermaking activities, and as long ago as 1917 the program of electrification of main drives was started. Today the plant operates a 21,000-kw. central power station to serve a pulp and paper mill with an average daily output of 300 tons, completely electrified and driven by approximately 1500 motors totaling 28,000 h.p. The history of this generating station and the growth of the papermaking facilities and paper production which made it necessary are traced. E.S.

PAPER MANUFACTURE

CRAIG, F. A. Practical paper making. No. 2. The constituents of paper. Paper & Print 22, no. 4: 389-90, 392 (Winter, 1949); *cf.* B.I.P.C. 20: 189.

A discussion is given of the common papermaking fibers, the blending of these materials, and the chemical constituents of paper, including sizing agents, mineral loadings, and dyestuffs. The importance of water in papermaking is also considered. J.A.B.

PAPER SIZING

BRAUNS, OTTO. The sizing degree as a function of pulp quality and method of alum addition. Svensk Papperstidn. 52, no. 23: 579-86 (Dec. 15, 1949). [In Swedish; English and German summaries]

A sudden high demand for domestic paper products during the years 1947 and 1948 forced a number of Swedish mills to use rejected dissolving pulp in place of ordinary bleached pulp. In many mills sizing difficulties were

encountered with this type of pulp. Although the manufacturing techniques were not changed, it was impossible to produce a paper with a satisfactory size resistance. A literature review confirmed the practical papermaker's experience that sizing difficulties increase with increasing purity of the pulp, although these difficulties can usually be overcome by the addition of larger quantities of size, introduction of starch preparations, or just improved and stricter control of operations. However, none of these expedients gave satisfactory results with dissolving pulp. In the present study at the Swedish Forest Products Laboratory a sizing technique with controlled alum additions was developed. On a laboratory scale it was found that the addition of about 0.2-0.4% aluminum sulfate (based on the airdry pulp) to pulps of different qualities before the actual sizing procedure results in optimum sizing effects, regardless of pH adjustment and the water used in the experiments, the details of which are described. A preliminary experiment is also mentioned for determining the possible relationship between optimum sizing degree and the carboxyl content of a given pulp; the present limited results would indicate that no such relationship exists. The possibilities of improving the sizing properties of bleached pulp by slight alum additions in the beater or at another suitable point prior to sale were investigated in three different mills; positive results were obtained in only one mill, where conditions were most similar to those of the laboratory experiments. The present results are, therefore, of limited practical significance, but warrant further fundamental investigations. 6 tables, 11 figures, and 10 references. E.S.

PAPER SPECIALTIES

ANON. Delicatessen pre-packaging. Modern Packaging 23, no. 6: 108-9, 188 (February, 1950).

A recent survey of the prepackaging of delicatessen items indicated that round, nested paper cartons, available in all sizes, are the most popular type of container for this purpose. These not only save storage space, but have a high consumer acceptance, particularly when fitted with window lids for easy identification. The four basic methods of labeling for this type of container are rubber stamping, the application of printed labels, marking with crayon pencils, and the use of imprinted cartons; usually a combination of these methods is used. 2 illustrations. J.A.B.

ANON. No more KP? Modern Packaging 23, no. 6: 107 (February, 1950).

Prepeeled potatoes, sliced or whole, are now available to the housewife in transparent polyethylene bags or in kraft bags lined with polyethylene film. When Miller's Pre-Pared Potato Co., Inc., Blue Island, Ill., devised a method by which peeled potatoes could be preserved, using harmless chemicals and proper refrigeration, polyethylene film was chosen for packaging because it has a satisfactory low water-vapor transmission rate, is strong and is unaffected by the preserving chemicals. The packaging procedure is described. 3 illustrations. J.A.B.

ANON. Sell the bakeries; many types of paper products used behind the scenes and in front. Paper & Twine J. 23, no. 12: 11-12 (February, 1950).

An important outlet for paper products is presented by bakeries, which use a variety of paper items and packaging supplies. Among those mentioned are round, square, and oblong fluted baking cups; biscuit, confection, and éclair cups; paper and solid board cake circles; corrugated cake pads and

circles; fluted and flat die-cut pan liners; three-piece angel food sets; paper pie plates; bakery bags and boxes; and wrapping paper and twine.
J.A.B.

ANON. Stereotype mat impression. Graphic Arts Monthly 22, no. 2: 98, 100, 138 (February, 1950).

The impression of the printing surfaces of stereotyping mats is obtained through the plastic-flow quality of the paper and through its stretch capacity; two entirely different conditions are involved, regardless of the type of mat paper used. Hot processes of stereotyping provide mats with a predominantly high percentage of plastic flow with low stretch values, whereas the cold processes yield products with a much greater stretch value than plastic flow. The plastic-flow point of the stereotype mat in molding is reached only by the "resist" of the molding blankets, whereas the stretch of the mat is obtained through their resiliency. Because of these opposing conditions of "resist" and "resiliency," the use of separate blankets in molding is recommended: a thin buoyant blanket (cork) next to the mat to produce the stretch and a firm fabric blanket to provide the resist required. However, the choice of molding blankets must also take into consideration the condition of level of the stereotype chases and the levels of the printing surfaces in the type form. E.S.

ANON. The use of waxed papers in the tobacco industry. Paper & Print 22, no. 4: 417-18 (Winter, 1949).

Because of the sensitivity of tobacco to atmospheric conditions, the most efficient form of packaging is the vacuumized airtight tin, but where this is not practicable, waxed paper may be used. The wax used in the preparation of the paper must be sufficiently flexible to prevent flaking and must have a sufficiently high melting point to prevent sticking while in storage; wax-coated paper is preferred to wax-impregnated paper. The packaging procedure is outlined briefly, with illustrations of wrappings used in hand-packed tobaccos. J.A.B.

AREND, A. G. Lead foil products for packing purposes. Brit. Packer 12, no. 1: 36 (January, 1950).

Although heavy lead foil continues to be used for packaging perishable materials, it is being replaced in many instances by bags made of foil-coated kraft paper. These are waterproof, airtight, lighter in weight, and considerably less expensive. Lead-clad plywood and lead-coated iron and steel sheets are some of the recently developed box and case materials utilizing lead foil. Recent improvements in the production of ordinary lead foil are mentioned. J.A.B.

DAY, Frederick T. Modern gummed papers. Brit. Printer 62, no. 370: 24-6 (January-February, 1950).

A general discussion is given of label papers, their uses, and recent developments in the field, such as noncurling gummed papers and high-speed, auto-feed gummed papers for printing on fast-running, automatically-fed printing machines. The body stock of British label papers includes woodfree (free from mechanical pulp), esparto, and rag (for expensive grades) furnishes. The various important and popular coatings and adhesives and their application to different papers are described, including those coated on both sides. Some of the special grades of labels and their characteristics are mentioned, such as luggage label paper, Woolstik, Stick to Glass, Permastik, Heatstick, and Heatfix. Reference is made to decorative gummed

papers, including metal-lined and metal-coated papers. Suitable labels are now available for nearly every purpose. 10 illustrations. J.A.B.

DYSARZ, FRANK. When you see the doc, don't just say a-h-h-h. Paper Sales 10, no. 2: 9-10, 34-5 (February, 1950).

The paper salesman can supply dentists and doctors with a wide variety of paper products, such as dental bibs made of absorbent creped tissue, wet-strength toweling, or paper backing bonded with a nonlinting cotton fleece fabric. Garbage bags which are paraffined, oiled, or waxed and treated with wet-strength agents; sanitary surgical sheets made from pliable, water-resistant paper and often coated with wax; tray covers of heavy absorbent bond; and many other items are useful in medical offices. This presents an opportunity for a steady, repeat market. J.A.B.

HARRINGTON, W. A. Aluminum foil as a packaging material. Paper Box Bag Maker: 13-14 (January, 1950); Brit. Packer 12, no. 2: 31-5 (February, 1950); Paper Market: 36 (February, 1950).

When used as a moisture vapor barrier, aluminum foil must be combined with paper or transparent film to reduce water penetration to a minimum. If moisture is to be retained within the package, the foil should be on the inside and the paper or film on the outside; to prevent the admission of moisture into the package, the positions must be reversed. The sealing of such wraps may be accomplished by the application of a thin thermoplastic coating, which also protects against corrosion. Aluminum foil has many applications in the dairy industry, for packaging butter and cheese and for capping milk bottles, and in the tobacco industry, where carefully controlled moisture content is essential. The chloride and sulfate content of foil and paper laminates must be kept within limits; unless the chloride figure (expressed as chlorine) is less than 0.07%, corrosion of the foil, in the form of white worms or blotches, will occur. J.A.B.

KOROLEFF, A. Snow fences of paper mesh. Pulp Paper Mag. Can. 51, no. 1: 110 (January, 1950).

During the last war, extensive tests were made in Germany of various types of snow fences, and those made of paper mesh appeared most satisfactory. These were made of spinning paper, impregnated with creosote, with a mesh width of 2-5 cm. and a paper thickness of 2-5 mm. The two edges were reinforced with wire. A similar fence, called "Snow-kraft," is now produced by Kraft Paper Products Limited, St. Johns, Que. It is weatherproof, waterproof, and rotproof; research with such materials for woods operations is recommended. 4 illustrations. J.A.B.

SOCIÉTÉ BAUMGARTNER & CIE, *Lausanne, Switzerland.* The conversion of paper. Papetier 3, no. 11: 34-7 (November, 1949). [In French]

Supplemented by simple diagrams, the manufacture of creped, four-color printed, gummed, toilet, waxed, and embossed paper and of paper napkins is outlined briefly. 6 diagrams. E.S.

PENSIONS, INDUSTRIAL

HERON, ALEXANDER R. Implications of changing of security background of our present systems. Paper Trade J. 130, no. 6: 19-21 (Feb. 9, 1950).

The principal elements in the problems of old-age security are reviewed. E.S.

PHOTOCHEMISTRY

ASHTON, D., CLIBBENS, D., and PROBERT, M. E. Some experimental observations on the photochemical degradation of dyed cotton. J. Soc. Dyers Colourists 65, no. 12: 650-7 + 3 plates; discussion: 657-8 (December, 1949).

The photochemical oxidation of cotton by air is sensitized by sulfur and basic dyes, as well as by vat dyes. As with vat dyes, with sulfur dyes there is a correlation between the color of the dye and its sensitizing action. With the basic dyes there is no such relation. The only direct dye so far observed which accelerated the photochemical oxidation was the thiazole dye Primuline. The introduction of the azo group into the Primuline molecule by oxidation, or by diazotizing and coupling, diminishes or destroys its photochemical action. Very small amounts of copper may exert a large effect on the photochemical action of all classes of dyes. The effect is a complicated one, but its net result is to diminish greatly the sensitizing action of the most active dyes. Many dyes liberate hydrogen peroxide on irradiation in moist air, but this action is prevented by the presence of small amounts of copper and of some other metals. There is a strong positive correlation between the liberation of peroxide by a dye on irradiation and its accelerating effect on the photochemical oxidation. The accelerating sulfur dyes do not, however, liberate detectable amounts of peroxide on irradiation. 2 tables, 13 figures, and 4 references. E.S.

BAMFORD, C. H., and DEWAR, M. J. S. Photosensitisation and tendering by vat dyes. J. Soc. Dyers Colourists 65, no. 12: 674-9; discussion: 679-81 (December, 1949).

The relative activities of a number of vat dyes have been compared for the following photosensitized reactions: (*a*) tendering of viscose, (*b*) autoxidation of tetralin, (*c*) polymerization of styrene, and (*d*) deactivation of the excited dyes by oxygen. The tendering activities show no correlation with (*c*) or (*d*) but show a moderate correlation with (*b*). It is concluded that the tendering of cellulose in the presence of water involves a preliminary oxidation of hydroxyl ion by the excited dye, and not a transfer of energy to oxygen as Egerton has postulated. The main tendering action involves hydrogen peroxide as an intermediate, in agreement with Egerton. The detailed mechanism is discussed. The tendering of dry cellulose, or of nylon, silk, or cellulose acetate, probably involves nonchain oxidations of the fabrics by the excited dyes. A mechanism is postulated which accounts for the nonformation of hydrogen peroxide in the absence of moisture. The quantum yield and the intensity exponent in the tendering of moist cellulose have been estimated. The effect of the distribution of dye in the fiber has also been studied. 4 tables, 1 figure, and 10 references. E.S.

EGERTON, G. S. The mechanism of the photochemical degradation of textile materials. J. Soc. Dyers Colourists 65, no. 12: 764-77; discussion: 778-80 (December, 1949); *cf.* B.I.P.C. 19: 337-9.

The photochemical degradation of textile materials is discussed under two main headings: I. Photolytic degradation with short-wave ultraviolet radiation. The degradation of cotton and other textile fibers with radiation of wavelength 2537 A. is not dependent upon the presence of oxygen in the surrounding atmosphere. In some cases (cotton and viscose rayon) the loss in strength in carbon dioxide or nitrogen is nearly as great as in oxygen; in other cases (nylon) there is greater degradation in oxygen, but still

substantial degradation in carbon dioxide. The effect of vat dyes on the rate of degradation of cotton is discussed. All the vat dyes examined were found to desensitize the photolytic degradation of cellulose. Dyes such as Caledon Yellow 5G and Cibanone Yellow R decreased the degradation of cotton in atmospheric air, dry oxygen, and inert gases. II. Photochemical oxidation with near ultraviolet and visible light. The photochemical degradation of cotton and other textile fibers by light transmitted through glass is increased by various dyes and pigments. The sensitizing dyes may belong to the following classes: vat, acetate, direct cotton, basic, acid, and sulfur; the pigments include zinc oxide, zinc sulfide, and titanium dioxide. The degradation of the various textile fibers is dependent upon the presence of oxygen in the surrounding atmosphere and is negligible in its absence. The mechanism of the degradation is discussed, and the evidence for the suggestion that the degradation is caused by oxidation of the fiber by activated oxygen and hydrogen peroxide is examined. Evidence is given which favors the belief that activated oxygen is a metastable form of molecular oxygen. 7 tables, 1 figure, and 83 references. E.S.

LANDOLT, A. The action of light on cellulose dyed with vat dyes. J. Soc. Dyers Colourists 65, no. 12: 659-71 + 2 plates; discussion: 672-3 (December, 1949).

The tendering activity of 38 vat dyes has been examined by various tests, and an attempt made to discover from the constitutions of the dyes which substituents are responsible for tendering or nontendering properties. It is found that most of the anthraquinone-carbazole dyes tested are nontendering. The tests on other groups of dyes show that certain substituents appear to exert a tendering influence and others a protective action. It seems that the simpler chemical compounds of the vat dye series have an inherent tendering action, which is repressed or enhanced by the nature and orientation of the substituents and the resulting configuration. It therefore seems unlikely that any general rule of tendering based on the chemical constitution of the dyes can be given. A difficulty in estimating the relation of constitution to tendering is the impossibility of comparing dyes of different light absorption, since the light energy depends on the wavelength. It is also found that both oxidation and reduction phenomena can be brought about by irradiating cotton dyed with vat dyes. This result confirms earlier suggestions that the tendering reaction may be caused by a succession of reducing and oxidizing processes. 7 tables, 13 figures, and 21 references. E.S.

PHYSICAL TESTING—FASTNESS TO LIGHT

COOPER, B. S., and HAWKINS, F. S. Spectral characteristics of light sources for fading and degradation testing. J. Soc. Dyers Colourists 65, no. 12: 586-95 + 1 plate; discussion: 595-6 (December, 1949).

The spectral distribution of energy in the visible and ultraviolet regions has been measured for the enclosed carbon arc commonly employed in a fading test apparatus. Tests have been made on both d.c. and a.c. arcs, and the effects of electrical loading, asymmetrical polar distribution, and obscuration of the enclosing globe have been investigated. Certain data are also presented for the high-intensity carbon arc and for three types of metal-vapor electric discharge lamp likely to be suitable for photochemical work. A comparison is made with incandescent tungsten sources and with sunlight for corresponding spectral regions. 4 tables, 9 figures, and 12 references. E.S.

LEAD, W. L. Artificial light-fastness tests on coloured textiles. J. Soc. Dyers Colourists 65, no. 12: 723-8; discussion: 728-31 (December, 1949).

A resume is given of the various factors which influence the rate of fading of colored textiles by natural and artificial light; reference is made to both published and unpublished results. The importance of humidity is stressed. Two dyes of equal fastness under one set of conditions are not necessarily of equal fastness under other conditions. Consequently, it is possible for a dye to be rated differently on the British Standard (S.D.C.) system according to the conditions of testing. It is impossible to express in a single number all the information about the fading behavior of a given dye. Agreement on a suitable physical method of measuring the degree of fading would help to remove some of the guesswork from present methods of color-fastness testing. 4 figures and 24 references. E.S.

MORTON, T. H. The practical assessment of the light fastness of dyeings. J. Soc. Dyers Colourists 65, no. 12: 597-602; discussion: 602-5 (December, 1949).

The testing of the light fastness of dyeings against standards such as those established by the Society of Dyers and Colourists is considered. It is shown that in practice certain anomalies are found, since the sample and dyeing do not necessarily follow the same course of fading. The discrepancies are examined on the basis of a simple theory, and certain recommendations are made with respect to the practice of light-fastness testing. The influences of quality of light, atmosphere, and mixture of dyes are discussed. 5 tables, 7 figures, and 5 references. E.S.

NORDHAMMAR, GÖSTA, and GRALÉN, NILS. Testing colour fastness in sunlight and artificial light. J. Soc. Dyers Colourists 65, no. 12: 741-2; discussion: 742 (December, 1949).

Spectrophotometric measurements of eight dyes on cotton or wool faded in sunlight and in the Fade-Ometer show the course of fading of the dyeings to be similar in the two cases. 1 table, 2 figures, and 1 reference. E.S.

SMITH, PHILIP WALTER. Observations on the anomalous light fastness of some dyed textiles. J. Soc. Dyers Colourists 65, no. 12: 743-4; discussion: 745-7 + 1 plate (December, 1949).

The anomalous behavior of certain direct and vat dyes on exposure to light under varying conditions is discussed, and the effect of crease-resisting resins of the urea-formaldehyde type on dyeings made with direct cotton, vat, and azoic dyes is reviewed. 2 figures. E.S.

VICKERSTAFF, T., and TOUGH, D. The quantitative measurement of light fastness. J. Soc. Dyers Colourists 65, no. 12: 606-10; discussion: 610-12 (December, 1949).

The conditions and criteria of light fading tests are reviewed. It is suggested that greater precision could be obtained by closer control of fading conditions including photoelectric measurement of light exposure, together with improved methods of assessing color change in terms of the number of just noticeable differences of color from the original shade. 1 table, 3 diagrams, and 23 references. E.S.

PHYSICAL TESTING—PAPER—ABSORPTION

KNIGHT, GEORGE D. Wettability of paper surfaces by water and the surface absorption of water by paper. Tappi 33, no. 2: 59-66 (February, 1950).

An apparatus which will reveal irregularities in the surface wettability of a sheet of paper was constructed, and a technique for its operation was devised. Surface patterns produced on several papers were visually compared, and the quantities and depths of penetration of dye solutions in the surface layers were calculated by means of an extension of the Kubelka-Munk relationships. The results did not correlate with standard physical paper tests. The surface wettability of paper was found to be extremely sensitive to practically any type of treatment. Results are of value in tub sizing, coating, gumming, or other converting operations concerned with the application of aqueous materials to paper, including printing with aqueous inks. The procedures may also be found to extend to solvent wettability of paper and, hence, to the fields of oil ink printing, lacquering, varnishing, and practically any operation dealing with the application of fluids to paper. 11 figures and 23 references. E.S.

PHYSICAL TESTING—PAPER—MOISTURE

[PAPER MAKERS ASSOCIATION OF GREAT BRITAIN AND IRELAND. *Technical Section. Paper Testing Committee*] Sampling and testing paper for moisture content. Paper-Maker (London) 119, no. 1: 32-4, 36, 38-40 (January, 1950).

The moisture content of many materials, including paper, is commonly determined by oven drying, and the change in weight of the material is assumed to result solely from the removal of water. This assumption is not always justified in the case of paper, because it may contain volatile constituents, other than water, or fusible components (fillers, dyes, and sizing materials), or the weight may change through oxidation and decomposition of the cellulose itself. In addition, practical experience has shown that the quantity of water removable from paper depends on the method of drying adopted; in oven drying, the values depend to a certain extent on the temperature and period of drying, the final stages being very slow and with no clearly defined end point. In view of these facts and of the complexity of the cellulose-water relationship, at present it is impossible to define the moisture content of paper in fundamental terms; it must be defined arbitrarily in terms of a particular method of drying. This is done in the present test method by specifying two recommended procedures: the first is based on oven drying and is suitable for the majority of papers, whereas the second is based on distillation with a solvent and is intended for papers (waxed papers) containing volatile or fusible constituents other than water. Particular attention is given to the method of sampling; whatever method is selected, care must be taken that the sample does not change appreciably in moisture content between the time of sampling and the actual test. The provisional recommended procedures for both drying methods are outlined, including apparatus, test sample, procedure, and reporting. In conclusion, a number of other suggested methods are discussed briefly under the general headings: vacuum desiccation method, rapid drying methods, titration method, and indirect (electrical) methods. The definition of moisture content, the rate of moisture change in paper on exposure, the method of expressing results in the literature, the effect of temperature and drying period on the test results in oven drying, the reproducibility of moisture tests in oven drying, a comparison of the distillation and oven-drying methods, and of

the vacuum desiccation and oven-drying methods, and the determination of distillation error in the entrainment distillation method are considered in eight appendices. 8 tables, 2 figures, and 6 references. E.S.

PHYSICAL TESTING—PAPER—PICK RESISTANCE

KANTROWITZ, M. S. Surface bonding strength of paper (Pick test). Printing Equip. Engr. 79, no. 5: 62 (February, 1950); *cf.* B.I.P.C. 13: 111-12.

Brief reference is made to the causes of picking of coated paper, the defects resulting from it on the printed image (the solid areas in particular), and the surface bonding-strength or wax test for measuring the resistance to picking (TAPPI Tentative Standard T 459 m-48). E.S.

PHYSICAL TESTING—PAPER—PRINTABILITY

DIEHM, ROBERT A. The elimination of the human element in the determination of printing quality. Tappi 33, no. 2: 42A, 44A, 46A, 48A (February, 1950).

A printability test is described which measures ink coverage with a typographical electrotype plate showing four tones in each of five different screens, ranging from 85 to 133 lines. Any good laboratory proof press can be used; the ink and printing mechanism are held constant and the paper is the variable. Since register is not required, it is only necessary to maintain a constant temperature of the ink, paper, and press while making the prints. From three to five prints should be made on each paper under investigation; these are examined for ink coverage and fidelity of print (presence of dots of uniform size in a continuous tone without distortion or broken contours). The procedures for arriving at numerical expressions of these values are outlined. Printing quality is the percentage of ink coverage obtainable in perfect print fidelity. 1 figure. E.S.

PHYSICAL TESTING—PULP—THICKNESS

CENTRAL LABORATORY OF THE CELLULOSE INDUSTRY. *Analysis Committee.* Determination of the mean gauge of pulp sheets. Svensk Papperstidn. 52, no. 23: 599-600 (Dec. 15, 1949). [In Swedish and English] *cf.* B.I.P.C. 20: 478.

The text is given of the Swedish Standard CCA21 for determining the thickness (mean gage) of a pulp sheet, disregarding felt marks. The volume of the pulp sheet is first determined by weighing in mercury; this value is then divided by the area of the sheet, and the resulting figure represents the mean gage. 2 illustrations in the Swedish text. E.S.

PLASTIC FILMS (NONCELLULOSIC)

PENN, W. S. Properties of plastic film. Part 4. Chemical resistance. Brit. Packer 12, no. 1: 29 (January, 1950); *cf.* B.I.P.C. 20: 264-5.

In considering the chemical resistance of plastic films, the author divides them into the following groups: cellulosics, vinyls, and miscellaneous, which include Pliofilm, nylon, polythene, and Fluon (polytetrafluoroethylene). The effects of acids, alkalies, salts, and organic chemicals on these plastics are described. Fluon, which is unaffected by corrosive chemicals, is the most resistant of all plastics and most other materials. The resistant properties of polythene may be improved by blending it with polyisobutylene.

J.A.B.

PLASTICS—HONEYCOMB

LINCOLN INDUSTRIES, INC., *Damascus, Va.* Furniture by the pound. Wood 5, no. 2: 22-3 (February, 1950).

One of the recent developments of this firm is the honeycomb-type core of panel for doors consisting of a wooden frame, the honeycomb center, and plastic-impregnated paper crossbands. Sixty-pound kraft paper is impregnated, dried before being cut, and honeycombed at the rate of about 80 ft./min. on a specially constructed machine. Impregnated paper crossbands have also been developed which fracture like wood when broken, instead of scuffing like paper. The facing can be of any type of wood desired. 7 illustrations. E.S.

PLASTICS—TESTING

STAFF, C. E., QUACKENBOS, H. M., JR., and HILL, J. M. Long-time tension and creep tests of plastics. Modern Plastics 27, no. 6: 93-6, 98, 100, 144-5 (February, 1950).

Thermosetting (commercial combinations of phenol-formaldehyde resins and fillers, such as wood flour, asbestos, chopped kraft paper, macerated fabric, cotton floc, and mica) and thermoplastic materials were maintained under constant load at 25 and 75° C. for periods ranging from 1000 to 14,500 hours. The creep was measured with electric strain gages, and from its course an estimate is made of the maximum stresses that can be sustained for five years by the thermosetting materials. Both creep and crazing govern the maximum stresses for the thermoplastics and these are estimated for one year. It is believed that the results are not confined to use in potential structural applications, but have their greatest value in many current problems. An examination is made of the accuracy and precision of the electric strain gage in measurements of creep. 3 tables, 19 diagrams, and 7 references. E.S.

PRINTING AND PRINTER'S INK

KING, CHARLES F. More about paper and ink. Inland Printer 124, no. 5: 77-9 (February, 1950); *cf.* B.I.P.C. 20: 421.

Continuing his discussion of printing troubles experienced by lithographers with coated papers, the author emphasizes the similarity between letterpress and offset printing and the need for further studies on the reactions which take place in the actual transfer of ink to paper in lithography. The impression has been created that lithography is primarily based on chemical reactions; in the author's opinion, the transfer of ink to paper is very similar in both processes, and the chemical nature of lithography dictates only the selection of ink which must have a certain resistance to the action of water or fountain solutions. Examples are given to show that the more complete the removal of ink from the blanket, the more troublefree will be the printing operation and the better the quality of the job. E.S.

REED, ROBERT F. Troubles in offset lithography. Am. Paper Converter 24, no. 2: 22-3 (February, 1950); Paper Mill News 73, no. 13: 14-15, 17 (April 1, 1950); Paper Trade J. 130, no. 12: 36-8 (March 23, 1950).

Offset paper should have sufficient pick resistance and moisture resistance, be free from chemical effects, and be perfectly flat, necessitating a uniform moisture content in approximate equilibrium with the pressroom atmosphere. The optimum relative humidity for the lithographic room is 45-50%, and this is maintained in many cases by air conditioning. Some of the difficulties

encountered as a result of using paper without the above requirements are: misregister, caused by improper trimming or paper that is not flat; a lowering of the surface tension of the plate moisture to a point where the ink will emulsify with it and produce an over-all tint, caused by surface-active materials in the paper; static electricity at very low relative humidity; and difficulty in drying the ink, sometimes caused by excessive acidity of the paper. These problems are discussed and some preventative measures suggested. J.A.B.

SHEARS. Shears reports on aniline printing. Shears 68, no. 686: 28-30 (February, 1950).

The chief advantage of aniline printing is the quick-drying ink, which virtually eliminates the time spent in racking and handling sheets. The rubber plates used in the process are cheaper than electrotypes and eliminate make-ready problems, so that plates for a new job can be prepared while the old one is still running. However, the box printer using this type of printing has had to confine himself to straight-line work, avoiding tints and halftones, and his production size is limited by the capacity of his press. The process requires special equipment, and because of the fluid nature of aniline ink, fine screen work becomes a problem. It is suggested that the aniline process may best be used by the paper box industry in combination with older methods, such as rotogravure. 2 illustrations. J.A.B.

PULP STONES

TOBA, S. Increased output with artificial stones. J. Japan. Tech. Assoc. Pulp Paper Ind. 3, no. 1: 10-20, 57 (February, 1949). [In Japanese; English summary]

An improved artificial pulpstone has been developed at the Tomakomai newsprint mill of Oji Seishi Kabushiki Kaisha (The Oji Paper Manufacturing Co., Ltd.). By the mechanization of the former hand stamping operation and the incorporation of iron reinforcing rings, a stone is obtained which exhibits increased uniformity, hardness, and mechanical strength. Claims are also made for a higher quality groundwood pulp, a greater output, and a reduction in stone breaks. 8 figures and 18 tables. E.G.S.

PURIFIED WOOD FIBER

JAYME, GEORG, and SCHENCK, UDO. The effect of different alkaline purification procedures on the behavior of the resulting pulps on acetylation. Das Papier 3, no. 23/24: 469-76 (December, 1949). [In German] *cf.* B.I.P.C. 19: 387-8.

The authors extended their work on the effect of hemicellulose content on the reactivity of dissolving pulps by studying the influence of hot and cold purification methods on their behavior during acetylation. The passivity toward acetylation of bleached spruce dissolving pulps subjected to cold alkaline purification with 8% sodium hydroxide for one hour could be reduced partially by a subsequent eight-hour alkaline treatment at 110° C. with 10% sodium hydroxide at a stock consistency of 10%. Stocks of high purity were obtained, although their acetylation reactivities were below those of purified cotton linters. The passivity of pulps purified with cold aqueous sodium hydroxide is ascribed to the formation of cellulose hydrate which, on hot purification, is partially reconverted to native cellulose. Although pulps obtained on cold purification, when dried, showed 38-46% irreversible cornification, these values dropped to 21-24% when the pulps were subse-

quently treated with hot aqueous sodium hydroxide. An unbleached sulfite pulp, purified with hot 10% sodium hydroxide and subsequently bleached for 2.5 hours with sodium hypochlorite at 5% consistency, acidified with 0.5% sulfur dioxide and thoroughly washed, gave a very reactive pulp containing 95.32% α-cellulose which showed 93.2% brightness in the Leukometer. The results indicate that the hot purification, combined with multiple-stage bleaching, is feasible and appears superior to a two-stage (cold-hot) treatment, although the latter results in products of very high purity. 5 tables, 5 figures, and 11 references. L.E.W.

RAYON—VISCOSE PROCESS

HESS, KURT, and HEPP, HELMUTH. The xanthation of alkali cellulose. III. The behavior of sodium-cellulose II in comparison with sodium-cellulose I. Melliand Textilber. 29, no. 9: 305-10; no. 10: 343-48 (September, October, 1948). [In German] *cf.* B.I.P.C. 1, no. 7: 6 (March, 1931); 2: 310.

The authors show that there is a distinct difference in the course of xanthation of ramie cellulose depending on whether the carbon disulfide is added to sodium-cellulose I (prepared with 17.8% sodium hydroxide at 15-20° C.) as is the usual commercial practice, or to sodium-cellulose II (prepared with 35% sodium hydroxide at 80° C.). With sodium-cellulose I, as previously observed by Hess and Trogus, the reaction is confined to the micellar surface of the fibers. With sodium-cellulose II, at ordinary temperatures only a very limited amount of carbon disulfide is taken up. At elevated temperatures (40-60° C.), however, xanthation occurs throughout the micelles, and a new lattice formation takes place which can be identified by x-ray diagrams. Studies have been made of the x degree (the number of molecules of carbon disulfide taken up per 100 glucose anhydride units) as a function of the reaction time and of temperature. From the sulfidizing and desulfidizing data, and x-ray analyses, it is concluded that the xanthation is a micellar heterogeneous reaction, and not quasihomogeneous. 8 tables, 21 figures, and 30 references. M.A.H.

RUBBER

ANON. Snap-top bag. Modern Packaging 23, no. 6: 98-101 (February, 1950).

A new type of Pliofilm bag for prepackaging fruit has a circular elastic top opening, which provides the necessary venting of carbon dioxide, retards spoilage, and at the same time retains a desirable amount of moisture. The 2-inch opening will not allow the fruit to fall out, but allows the wholesaler and retailer to reach in and replace pieces of fruit that have begun to spoil. In the filling operation, this elastic expands to fit around a bagging head on a mechanical weigher. A speed of 350 bags per hour per filler may be attained by an experienced operator. The consumer acceptance of fruit prepackaged in these bags has been greater than that of fruit sold in bulk, even in cases where premium prices are charged. 7 illustrations. J.A.B.

SAFETY

HENRY, DALLAS E. Industrial injury control as it applies to the superintendent. Paper Trade J. 130, no. 6: 16, 18 (Feb. 9, 1950).

An injured worker is a symbol of a failure on the part of supervision in the department. The steps are discussed which a superintendent can take to control these injuries; the first step must be his sincere belief that acci-

dents can be controlled. The pulp and paper industry, the sixth largest industry of the nation, ranks 26th out of 40 industries with regard to its injury rate and 31% above the average for the 40. The average compensation and medical and insurance cost of each industrial injury during 1948 was $559.00, not including the down time consumed in caring for the injured worker, replacing him, or making repairs to equipment. The total injury cost usually runs from four to five times the compensation and medical charge. In addition to creating an expense, injuries adversely affect industrial relations. The need for a reduced accident rate in the industry is therefore very apparent. E.S.

SHIPPING CONTAINERS

ANON. Container for crown closures. Fibre Containers 35, no. 1: 61 (January, 1950).

A container for crown corks, designed by Union Bag & Paper Corp., New York, has a bellows top to facilitate pouring, is dustproof, and may be resealed after use. The box is made of kraft board, with a 46-lb. water-finish liner on the outside, a 42-lb. dry-finish liner inside, and a kraft corrugating medium. One end of the top is constructed so that when the outer flap is lifted, an inner flap is drawn out, forming a pouring spout. 1 illustration. J.A.B.

ANON. New packing method for bicycles. Brit. Packer 12, no. 1: 30 (January, 1950).

An improvement over the former practice of packing bicycles by first wrapping them, then attaching two protective strips of wood, is embodied in the new method devised by J. A. Phillips & Co., Ltd. The bicycle is placed in a casing 24 inches high and 74 inches long (shorter for smaller bicycles), made of double-faced corrugated board. This is lighter, more economical, and more pleasing in appearance than the wooden strips formerly used. After unpacking, the casings can be folded flat and returned to the manufacturer. 1 illustration. J.A.B.

ANON. New perishable boxes. Fibre Containers 35, no. 1: 37 (January, 1950).

Supplements recently issued to Freight Container Tariffs provide for two new types of fiberboard boxes, one a fruit tray and the other an apple and pear box. The former, Container No. 7475, consists of an inverted and ventilated body tray and a bottom tray, both made of 15-lb. test moisture-resistant corrugated board, with .010 liners. The apple and pear box, Container No. 5803, has a perishable display type of body, with a telescoping taped tube in the form of a sleeve; both are made of 200-lb. double-faced corrugated, moistureproof board. 2 illustrations. J.A.B.

PARSON, A. O. Fabricating quality and performance into corrugated shipping containers. Paper Trade J. 130, no. 7: 26, 28 (Feb. 16, 1950); Am. Boxmaker 39, no. 2: 16-18 (February, 1950); Paper Ind. 31, no. 12: 1473-5 (March, 1950); Fibre Containers 35, no. 2: 54, 59 (February, 1950).

New and improved testing equipment and techniques have placed the responsibility for quality and performance in the hands of the paper converter, and this, along with the more rigid specifications set up by container users and shippers, has made him very fabrication-minded. Corrugated containers and combined board are subjected to about 12 different tests, some set up by the container user, some by shippers and ICC regulations, and some by

the converter himself. The ability to withstand rough treatment is determined by the Mullen, compression, puncture, crush, drum, drop, score tear, impact, and adhesion tests, and tests are also made for weight, caliper, and moisture. The primary steps in container manufacturing which affect quality and performance are discussed in some detail, and suggestions are made for achieving the desired results. 1 illustration. J.A.B.

SHIPPING CONTAINERS—EXPORT PACKAGING

GREEN, FRANK W. American export packaging today. Fibre Containers 35, no. 1: 90-2 (January, 1950); Packaging Parade 18, no. 205: 86-8 (February, 1950); Am. Boxmaker 39, no. 2: 19, 22-3 (February, 1950); Shears 68, no. 686: 43 (February, 1950).

A report is given on a recent study conducted by the Maritime Association of the Port of New York to determine the reasons for damaged export shipments. It was found that many shipments were so poorly packed and handled before they reached the piers, that they could not be expected to arrive at their destination intact. The comparative advantages of each type of container are discussed, including nailed wood, corrugated, solid fiber, cleated plywood, and wood-cleated fiber boxes; open and sheathed crates; wirebounds; steel and fiber drums; wooden barrels, casks, or kegs; bales; bundles; and paper bags. The possibilities of damage caused by improper storage on the piers, handling to the ships, and stowage in the holds are also considered. J.A.B.

SHIPPING CONTAINERS—FROZEN FOODS

ANON. "Vacuumatic" container controls temperatures. Packaging Parade 18, no. 205: 80 (February, 1950).

Controlled temperature is achieved in the new double container developed by Little America Frozen Foods, Inc., Pittsburgh, with wrapped dry-ice blocks, corrugated pads, and an inch of spun glass insulating material. The box, made of 500-pound test board, weighs only ten pounds and reduces shipping costs by two thirds. A pallet may be strapped to the container to facilitate handling and to keep the container dry. 1 illustration. J.A.B.

SHIPPING CONTAINERS—PALLETIZING

ANON. Cigarette wrappers on corrugated pallets. Fibre Containers 35, no. 1: 40 (January, 1950).

A single-service pallet is described for the shipment by truck of printed cigarette wrappers. The wrappers are first packed in corrugated boxes which have ventilation holes, then, using interlocked block loading, are placed on corrugated pallets of the Addison-Semmes type. The ends of the boxes in the bottom layer are supported by posts made of convolutely wound and glued single-faced materials. The load is reinforced with three Gerrard steel straps. 3 illustrations. J.A.B.

SHIPPING CONTAINERS—STATISTICS

ANON. Paperboard and paperboard container exports. Fibre Containers 35, no. 1: 28, 30, 32 (January, 1950).

The Department of Commerce has released figures showing United States exports of paperboard, corrugated, solid fiber, folding carton, and setup boxes for the year 1948 and a few preceding years. The over-all picture for all types of containers, except textile, shows export values down about

13% from the 1947 high. The three major factors apparently responsible for this are: a diminishing supply of dollars, the availability of formerly scarce materials in some foreign countries, and the resumption of foreign competition. Accompanying tables, showing export values according to year and to the country of destination, indicate that our best customers, exclusive of the Philippines, are closely grouped in North and Latin America, with no European country appearing as a major importer. Boxmakers are advised to direct their efforts toward improving quality and finding new uses for their products to stimulate greater consumption in the U. S., rather than to expect to do a lucrative business in the export field. 5 tables.
J.A.B.

SHIPPING CONTAINERS—TESTING

DIJK, J. W., and KAESS, G. Testing the suitability of packaging materials as containers for cold-storage goods. III. Wet-strength requirements in packaging. Das Papier 3, no. 21/22: 424-8 (November, 1949). [In German] *cf.* B.I.P.C. 14: 369.

By making measurements of the cross-sectional changes (taken in the middle of the package vertical to the longitudinal axis), the percentages of deformation were computed for standard "Eco" containers (made from two chemical pulp plies laminated with an intermediate layer of aluminum foil) filled with water, frozen at −12° C., and subsequently thawed at 20° C. and 65% R.H. The over-all maximum permissible deformation (I) (expansion or bulging) in an 800-cc. container was 11%. A correlation was found to exist between the wet stiffness of containers moistened with water and thawing foodstuffs. However, no such relationship was obtained in the case of the wet bursting strength. The minimum value for stiffness at (I) was 140 grams (as determined with the Bekk tester). When the container walls consisted of two laminated plies, the wet strength was two to three times as high as the sum calculated from the stiffness of the individual plies. Cartons made from boards containing appreciable amounts of groundwood pulp were less subject to deformation than were those low in groundwood or consisting only of cardboard made from bleached chemical pulps. 5 tables and 3 references.
L.E.W.

SPECTROSCOPY, INFRARED

KUHN, LESTER P. Infrared spectra of carbohydrates. Anal. Chem. 22, no. 2: 276-83 (February, 1950).

The infrared absorption curves for 79 different sugars and their derivatives and for some cellulose derivatives (nitrocellulose, methylcellulose, cellulose acetate, and three different tritylcellulose compounds) have been obtained. Anomeric forms of various glycosides and sugar esters are readily distinguished by their infrared curves, as are the various isomeric sugars and sugar alcohols. Infrared spectroscopy is an excellent tool for the identification of sugars and of important functional groups in carbohydrate materials including cellulose. The possibilities for the quantitative determination of nitrate groups in nitrocellulose are indicated. 2 tables, 5 figures, and 2 references.
E.S.

STARCH

KERR, RALPH W. The action of nitrogen dioxide on corn starch and its fractions. J. Am. Chem. Soc. 72, no. 2: 816-20 (February, 1950).

A study was made of the reaction between nitrogen dioxide in the gaseous state and cornstarch and its fractions in the solid state. The percentage of uronic acid carboxyl groups found in amylose after oxidation was greater than in oxidized amylopectin; whole starch gave a value intermediate to the

two fractions. These results qualitatively support the view that branching through glucoside linkages to carbons number 6 is more extensive in amylopectin than in amylose molecules. It was also found that the physical form of the carbohydrates, as well as moisture associated with, or formed in the starch, influenced the oxidation reaction rate. Additional data are given to show that moisture also facilitates hydrolysis of glucoside linkages which makes possible the formation of saccharic acid groups at the points of scission. Carbon-6 carboxyl groups in saccharic acid were found to be relatively more stable in a decarboxylation reaction with hydrochloric acid than uronic acid carboxyls. 1 table, 4 diagrams, and 15 footnotes. E.S.

WHELAN, W. J., and PEAT, STANLEY. The photochemical degradation of starch and allied carbohydrates. J. Soc. Dyers Colourists 65, no. 12: 748-56; discussion: 756-7 (December, 1949).

The breakdown of carbohydrates by ultraviolet radiation has been studied, using as the principal substrate the amylose component of potato starch. Two distinct types of photodegradation are recognized: One type, occurring in the presence of oxygen, is a photo-oxidation (for which zinc oxide is a powerful sensitizer) followed by a light-sensitized hydrolysis and further oxidation, which results in the complete conversion of the amylose to carbon dioxide, via the intermediate products formaldehyde and formic acid, all three of which have been identified. The photo-oxidation is believed to be similar to oxidation effected by the periodate ion, which oxidizes the α-glycol group situated at C-2 and C-3 of the glucopyranose ring, with the production of two aldehyde groups. Hydrolysis of the oxidized amylose liberates fresh α-glycol groups, and further oxidation then ensues. The results of the aerobic photodecompositions of potato starch, potato amylopectin, maltose, glucose, and α-methyl glucoside agree with, and provide additional support for this hypothesis. The second form of photodegradation takes place in the absence of oxygen, and has been studied in an atmosphere of highly purified nitrogen. The final products, as yet unidentified, do not include those of the aerobic degradation, and are characterized by a marked resistance to subsequent photo-oxidation. 2 tables, 8 figures, and 22 references. E.S.

STEAM POWER

CUMMINS, ANDREW A. Paper-plant modernization proves that survey pays. Power 94, no. 2: 110-13 (February, 1950).

River Raisin Paper Co., Monroe, Mich., engaged a consultant to make a thorough engineering survey before modernizing its power plant. The survey revealed heavy heat losses in the present installations and possibilities for substantial savings through new and improved equipment. A detailed description of the new installation is given, including a semioutdoor four-drum boiler, spreader-stoker firing equipment burning almost any kind of coal, a noncondensing General Electric 7500-kw. turbine and generator, and a change from steam to motor drives throughout the mill. The former coal handling system was moved outside and the turbine room, boiler-feed pumps, etc. were put in its place. This change and the semioutdoor boiler construction permitted the re-use of the centrally located existing boiler house, so that the cost for steam and electric lines could be kept low. 2 tables and 7 figures. E.S.

HÖGLUND, T. Automatic soot blowing for high-pressure boilers. Svensk Papperstidn. 52, no. 24: 610-13 (Dec. 31, 1949). [In Swedish; English and German summaries]

The author describes the advantages of fully automatic, compressed air-

type soot blowers for high-pressure boilers, economizers, and preheaters. The installation is particularly useful for the removal of the heavy deposits in the furnaces used in alkaline cooking processes, which previously had to be shut down for cleaning after a week's operation. With the automatic system, soot blowing is carried out frequently, so that the heating surfaces are kept uniformly clean, irrespective of the kind of fuel used. The installation can be adapted to individual plants and conditions; recording instruments keep a continuous record of each blower cycle and immediately indicate defects in the operation of individual blower lines. 1 diagram. E.S.

WOLLENBERG, R. P., and SUTHERLING, V. M. Longview Fibre Co.'s new plant; power and recovery. Pulp & Paper 24, no. 2: 36, 38, 40-2, 45 (February, 1950).

A new high-pressure steam and electric plant of the Longview Fibre Co., Longview, Wash., has started operations. The principal equipment consists of a Combustion Engineering black liquor recovery furnace with a steam capacity of 100,000 pounds per hour, two Babcock and Wilcox direct-fired boilers, and two General Electric turbines. The direct-fired boilers are equipped to burn oil; one is also equipped to burn hogged fuel, and each has a capacity of 230,000 pounds of steam per hour. These two boilers are designed for outdoor installation, which has not yet been used to any extent in the Northwest. The startup of the plant has permitted the retirement of three old direct-fired boilers and three recovery units. The recovery boiler was installed in the former recovery room after removal of some of the old boilers. Details of the various installations are given, supplemented by a power plant heat-balance flowsheet and 10 illustrations. In conclusion, the principal equipment and the names of the suppliers are listed. E.S.

SULFITE PROCESS

EGUCHI, H., and ITO, H. A study of the sulfite digestion of rayon pulp. I. Effect of maximum cooking temperature. J. Japan. Tech. Assoc. Pulp Paper Ind. 3, no. 5: 21-8, 47 (September, 1949). [In Japanese; English summary]

As digestion progresses, the Sieber number and yield of the unbleached pulp decrease, and the viscosity of the delignified pulp falls off; at the same time, the α-cellulose content increases for any given maximum cooking temperature. The α-cellulose content reaches a maximum value within a satisfactory viscosity range, but decreases on overcooking. The higher the maximum cooking temperature, the greater is the α-cellulose content and the lower the yield of constant-viscosity pulp. At an intrinsic viscosity [η] of 6.0, for instance, the α-cellulose content increases 0.2% for a 10° C. rise in the maximum cooking temperature; correspondingly, the pulp yield decreases approximately 0.7%. E.G.S.

EGUCHI, H., and ITO, H. A study of the sulfite digestion of rayon pulp. II. Effects of maximum cooking pressure, penetration time, and cooking-temperature gradient. J. Japan. Tech. Assoc. Pulp Paper Ind. 3, no. 6: 15-24, 50 (November, 1949). [In Japanese; English summary]

Pulp yield and quality are virtually independent of small changes in the maximum cooking pressure, the acid liquor penetration time, and the cooking-temperature gradient; however, when the penetration time is extended considerably, the α-cellulose content of the pulp is decreased accordingly. It should be noted that the maximum cooking temperature exerts a relatively

significant influence on pulp quality. 5 tables, 15 figures, and 11 references. E.G.S.

NISHI, I. The cooking cycles of sulfite digesters. J. Japan. Tech. Assoc. Pulp Paper Ind. 3, no. 1: 2-4, 57 (February, 1949). [In Japanese; English summary]

The cooking cycle of a sulfite digester can be controlled with the aid of empirical formulas based on mill data. The relationships between the operating temperature, cooking cycle, and total acid content of the cooking liquor are considered. 1 table and 4 figures. E.G.S.

TANNINS

STEPHEN, ALISTAIR M. The chemical constitution of wattle (Mimosa) tannin. Part I. J. Chem. Soc.: 3082-5 (December, 1949).

The bark of *Acacia mollissima* yields an extract, soluble in water and in acetone, which contains tannins and nontannins in the ratio of 10:1. The extract is polyphenolic in character and of molecular weight greater than 2000. Oxidative degradation products include resorcinol, gallic acid, and styphnic acid from tannin, and veratric and *O*-trimethylgallic acids from methylated tannin. No evidence for the presence of phloroglucinol units in the structure was obtained. Calculated on a C_{15} basis, the average composition of the material corresponds to the formula $C_{15}H_{14}O_{6.5}$. Of the oxygen atoms, 4.25-4.5 are present in hydroxyl groups and, since other functional groups are absent, the remaining oxygen is presumably present in ether linkages. Bromine replaces 4-5 hydrogen atoms per C_{15} residue. E.S.

VANILLIN

PEARL, IRWIN A., and BEYER, DONALD L. Reactions of vanillin and its derived compounds. X. Caustic fusion of vanillin. Ind. Eng. Chem. 42, no. 2: 376-9 (February, 1950); *cf.* B.I.P.C. 19: 878.

Certain variables in the reaction of vanillin with fused caustic alkali to yield either vanillic (4-hydroxy-3-methoxybenzoic) acid or protocatechuic (3,4-dihydroxybenzoic) acid have been studied. Mixtures of potassium and sodium hydroxide containing between 20 and 60% sodium hydroxide proved to be the most suitable for the oxidation reaction. As the percentage of sodium hydroxide increased, the resulting acid became progressively more yellow. For the preparation of protocatechuic acid, any mixture of caustic alkalies may be employed, whereas, for the preparation of vanillic acid, the necessity for higher temperatures and/or longer reaction times with high sodium hydroxide ratios invariably results in demethylation and the formation of some protocatechuic acid. Time as well as temperature has been found to play a role in this demethylation reaction. Alkali-vanillin molecular ratios of 4:1 and 6:1 are necessary for obtaining high yields of vanillic acid and protocatechuic acid, respectively. 5 tables, 2 figures, and 5 references. E.S.

VIBRATION

ANON. Vibration analysis by the use of reed vibrometers. Paper-Maker (London) 119, no. 1: 21 (January, 1950); Paper Market: 50 (February, 1950).

The use of reed vibrometers for the simple on-site analysis of a vibrating structure and the detection of the causes of the disturbing forces is explained. The instrument incorporates a reed in the form of a steel strip whose effective length can be varied by means of a knob on the side of the vibrometer,

until the natural frequency of the reed coincides with the frequency of the disturbance. A scale on the vibrometer indicates the fundamental frequency of the vibration and, by varying the position of the vibrometer on the structure under test at various vertical to horizontal positions, the natural frequency and mode of vibration can be observed, as well as the direction in which the maximum disturbance is acting, as shown by the maximum movement of the reed. 2 illustrations. E.S.

VISCOSITY

CRAGG, L. H., and SIMKINS, J. E. The effect of chain length on the intrinsic viscosity-temperature coefficient of linear high polymers. Can. J. Research 27 B, no. 12: 961-71 (December, 1949).

Careful measurements of the intrinsic viscosities of three fractions of polystyrene, ranging in molecular weight from 160,000 to 1,350,000, have been made over a 40° C. temperature range in a good solvent (toluene) and a poor one (toluene—30% 1-butanol). These, together with similar but somewhat less accurate measurements with five fractions of GR-S, show clearly that solvent effects on the intrinsic viscosity are strongly dependent on molecular weight for linear flexible polymers, and give additional support to the concept that the differences in the intrinsic viscosity of such a polymer in good or poor solvents are caused primarily by differences in the looseness or tightness of coiling of its flexible molecules in solution. There is good reason to believe that these polymers are much more flexible than those of cellulose acetate or cellulose nitrate. Other factors being equal, lesser effects should be expected with cellulose derivatives (particularly those at lower molecular weights), than those reported here. 3 tables, 4 diagrams, and 27 references. E.S.

WASTE PAPER

LENDAL, FOLMER, and FLINDT-KRUSE, ERIK. Waste paper as raw material for paper and board in the United States and Europe. Finnish Paper Timber J. 31, no. 23: 450-8; no. 24: 477-81 (Dec. 15, 31, 1949). [In Danish; English summary] *cf.* B.I.P.C. 18: 477-8.

The article is identical with the previous reference. E.S.

WAXES

MARSEL, CHARLES J. Latest carnauba wax study. Chem. Inds. 66, no. 2: 216, 218 (February, 1950).

A report is given on a study of carnauba waxes, undertaken for the purpose of improving well-known wax tests and obtaining accurate test values from a wide variety of samples as a basis for standard specifications. Fifty-six samples of crude carnauba wax, most of them obtained from Brazilian wax exporters, were ground to five mesh, and representative samples were tested for dirt and moisture, flash point, melting point, acid number, saponification number, iodine number, and emulsification. The results of these tests are recorded and interpreted. Although no one test is conclusive in defining a wax sample, a careful determination of two or three of the constants listed above should serve to characterize the wax. A careful study to determine the effect of variables upon emulsification and the development of sensitive tests (other than those already mentioned) for the detection of various possible adulterants is recommended for future research. 1 illustration. J.A.B.

WOOD—EXTRACTIVES

GRIPENBERG, JARL. Antibiotic substances from the heart wood of *Thuja plicata* D. Don. VI. The structure of thujic acid (dehydroperillic acid). Acta Chem. Scand. 3, no. 9: 1137-46 (1949). [In English] *cf.* B.I.P.C. 20: 49.

The dehydroperillic acid of Anderson and Sherrard has been shown to be 4,4-dimethyl-2,5,7-cycloheptatrienecarboxylic acid, and the name "thujic acid" is proposed for it. 1 diagram and 11 references. E.S.

LINDSTEDT, GÖSTA. Constituents of pine heartwood. XIV. The heartwood of *Pinus monticola* Dougl. Acta Chem. Scand. 3, no. 9: 1147-52 (1949). [In English] *cf.* B.I.P.C. 20: 356-7.

A report is given of an investigation of the heartwood of *Pinus monticola* Dougl. Pinitol (monomethyl ether of D-inositol), L-arabinose, chrysin (5,7-dihydroxyflavone), strobopinin (probably a *C*-methyl dihydroxyflavanone), tectochrysin (5-hydroxy-7-methoxyflavone), and pinosylvin monomethyl ether were isolated. Experimental data are given. 5 references. J.A.B.

WOOD—SACCHARIFICATION

SUNDMAN, JACOBUS, SAARNIO, JOUKO, and GUSTAFSSON, CHARLEY. A paper-chromatographic study of the carbohydrate composition in different wood species. Finnish Paper Timber J. 31, no. 24: 467-71 (Dec. 31, 1949). [In Swedish; English summary]

The compositions of the carbohydrates of hydrolyzates from six different wood species (spruce, pine, juniper, *Thuja occidentalis,* willow, and birch) were investigated by means of paper partition chromatography. A satisfactory separation of the monosaccharides was obtained when sufficiently long irrigation periods were used. To avoid a possible epimerization of the sugars, the hydrolyzates were deacidified by means of anion exchangers instead of by the customary neutralization with barium carbonate. In addition to glucose and xylose, mannose and galactose were found in the hydrolyzates of all the softwood and hardwood species investigated. Arabinose, on the other hand, occurs in the softwood species, but is lacking or present in very minute quantities only in the hardwood species. Special tests for detecting the presence of lyxose in sprucewood gave negative results. 2 tables, 6 figures, and 14 references. E.S.

WOOD OPERATIONS

ANON. Logging at Iroquois Falls; mechanization being extended gradually. Pulp & Paper 24, no. 2: 68, 70 (February, 1950).

An illustrated description of the company's logging methods is given. Progress is being made in the gradual mechanization of logging techniques. Experiments are under way to determine the relative merits of mechanical and horse transportation of logs. The mechanical method adopted is the yarding of bunched wood; costs are reported to be competitive with horse logging. Tractors and trailers are also used fairly extensively. 4 illustrations. E.S.

COLLIER, R. D. Loading pulpwood out of water with crane and basket. Pulp Paper Mag. Can. 51, no. 2: 65-6 (February, 1950).

A system is described for scooping loose pulpwood out of the water with a basket coupled with a heavy-duty crane which unloads the wood directly

onto the barges. Four scows with a capacity of 170 cords each can be loaded in a 10-hour day by a crew of 18 men; the cost of loading has been considerably reduced. 3 illustrations. E.S.

COLLIER, R. D. Splitting large bolts with "guns." Pulp Paper Mag. Can. 51, no. 2: 64-5 (February, 1950).

The handling of excessively large pulpwood bolts may be simplified by splitting them with portable "guns" in the woods. The construction and use of these guns is described; during dry seasons, precautions should be taken against the possibilities of starting fires. 2 illustrations. E.S.

LEMAY, P. V. Logging at Marathon. Pulp Paper Mag. Can. 51, no. 1: 100-102 (January, 1950); *cf.* B.I.P.C. 20: 211.

A description is given of the mechanical logging operations carried out by Marathon Paper Mills of Canada Limited. Great care is taken in the selection of areas to be cut over, since the management plan is based on the assumption that the operation will be permanent. This is similar to the previous article. 4 illustrations. J.A.B.

X-RAY RESEARCH

SEN, J., and BANERJEE, B. K. X-ray investigation on the change in orientation of cellulose in sound and infected tracheids of chir (*Pinus longifolia*). Science 111, no. 2876: 151 (Feb. 10, 1950).

Small pieces of untreated chir sapwood, both sound and infected with *Lenzites striata*, were photographed, with the x-ray beam normal to the tracheal axes of the tangential sections. The degree of disorientation of cellulose crystallites from the tracheal axis was found to be much greater in the sound sample than in the infected sample, and these results were confirmed by microscopic examination. This indicates that the cellulose orientation can be changed by means of enzymatic hydrolysis. 2 figures and 4 references. J.A.B.

WINOGRADOFF, N. N. X-ray irradiation of cellulose acetate. Nature 165, no. 4185: 72 (Jan. 14, 1950).

The physical properties of many plastics are modified when they are exposed to light or ultraviolet radiation, as is illustrated by the experiments reported here. A decrease in tensile strength was observed when samples of undyed, unoiled cellulose acetate yarn were exposed to x-ray radiation for periods of up to 190 hours, and a decreased crystallinity was evident from x-ray diffraction photographs of a clear sample of cellulose acetate which had been exposed for 40 hours. The chemical and structural changes occurring during long exposures required for x-ray diffraction patterns may influence the interpretation of the diagrams. 1 photomicrograph and 2 references. J.A.B.

Patent Section

Although the abstracts of the United States patents are prepared from the patents themselves, the initial selection of the patents to be abstracted is made from the Patent Gazette *and, therefore, it is possible that the patent section will not contain all patents of potential interest to the industry. The abstracts of the Canadian patents are prepared from the claims published in the* Canadian Patent Office Record. *In so far as possible, an attempt will be made to indicate patents issued in both countries.*

The patent abstracts are listed under the various headings currently used for the abstracts of periodical articles.

Printed copies of United States patents can be obtained from the Commissioner of Patents, Washington, D.C.; the price is 25 cents per copy. Canadian patents up to and including December, 1948, are available only as manuscripts or photostatic copies and an estimate of the cost of a patent should be obtained from the Commissioner of Patents, Ottawa, Canada, in advance of the order. With January, 1949, printed copies of Canadian patents are available at 25 cents per copy of less than 50 sheets of printed matter. For patents of 50 sheets or over, the price is $1.00 per copy. Until the printing branch is in full operation and up to date, the printing of specifications will be several months behind.

BOARD, LAMINATED

WACHTER, JOSEPH J. Odorless phenol-formaldehyde resinous products. U. S. patent 2,482,525. Filed Oct. 19, 1945. Issued Sept. 20, 1949. 8 claims. Assigned to Westinghouse Electric Corporation. [Cl. 260-29.3]

A phenolic resin-impregnated paper product with a low odor level is suitable for use with foods. The impregnating composition consists of the reaction product of 1.0 mole of phenol, 1.15-1.35 moles of formaldehyde in aqueous solution (heated to 100° C., refluxed for 1.5-2.25 hours in the presence of 0.45-0.55% of ethylene diamine as a catalyst, and vacuum distilled at 100-150° C. under a pressure of 0.01-0.2 atm.), 40-180% (based on the weight of the reaction product) of a water-miscible volatile, liquid organic solvent (e.g., ethanol, methanol, acetone, etc.), and 10-100% of water. E.G.S.

BOARD, WATERPROOF

CAESAR, GEORGE V., BAUER, JORDAN V., and HAWLEY, DON M. Multiweb bonded paper products. U. S. patent 2,496,440. Filed Nov. 14, 1946. Issued Feb. 7, 1950. 5 claims. Assigned to Stein, Hall & Company, Inc. [Cl. 154-141; changed to 154-45.9]

A quick-setting, waterproof adhesive is designed for use with high-speed paperboard bonding machines; the adhesive composition comprises 15-85% (based on the weight of total solids) of starch gelatinized *in situ*, 5-50% of a urea-formaldehyde resin, and 5-75% of hydrosol-forming materials. E.G.S.

BOARD SPECIALTIES

BAILAR, CHARLES O., and SPALDING, THOMAS L. Tray. Canadian patent 462,886. Filed April 21, 1949. Issued Jan. 31, 1950. 2 claims. Assigned to Marathon Corporation.

This is the same as U. S. patent 2,470,456; *cf.* B.I.P.C. 20: 443. E.G.S.

BLANCHET, JOSEPH E. A. Core for yarn or thread packages and method of making the same. Canadian patent 463,345. Filed May 26, 1947. Issued Feb. 21, 1950. 9 claims. Assigned to Sonoco Products Company.

A paper core for a yarn or thread package comprises a convolutely wound tube with inturned end portions. The invention corresponds to U. S. patent 2,288,966, which was issued July 7, 1942. E.G.S.

BRUCKNER, MARTHA L., and BRUCKNER, WILLIAM S. Service tray. U. S. patent 2,466,636. Filed Nov. 14, 1947. Issued April 5, 1949. 1 claim. Assigned to Martha L. Bruckner. [Cl. 224-48]

A disposable fiberboard lap tray incorporates openings which are adapted to receive such articles as a paper cup, a spoon, a package of straws, and a packaged sandwich. E.G.S.

HOWARD, VIOLA T. Display device. U. S. patent 2,465,968. Filed Jan. 20, 1947. Issued March 29, 1949. 3 claims. Assigned to Swank, Inc. [Cl. 248-174; changed to 248-198]

A heart-shaped, easel-like, cardboard structure is adapted for the display of jewelry and the like. E.G.S.

MACKLING, ALVIN H. Ticket and coin holder. Canadian patent 463,275. Filed May 5, 1947. Issued Feb. 21, 1950. 8 claims.

A holder for milk tickets, coins, and the like is designed to fit around the neck of a milk bottle; the device comprises a flexible collar portion and a slotted ticket-holding panel. E.G.S.

MARCUS, MORRIS L. Support for hats. U. S. patent 2,466,605. Filed Oct. 9, 1945. Issued April 5, 1949. 3 claims. [Cl. 206-8; changed to 206-9]

A cardboard hatbox is equipped with a number of tiered crown supports, so that several hats may be stored simultaneously without contact with each other. E.G.S.

MATHEWSON, ALBERT. Mailable display holder. U. S. patent 2,464,879. Filed Dec. 10, 1946. Issued March 22, 1949. 2 claims. [Cl. 40-124.1]

In one position, a cardboard greeting card can be sent through the mails with its picture or message completely protected; upon receipt, it can be converted into a display easel for a photograph. E.G.S.

REID, EDWARD S. Paper tube assembly for concrete construction. U. S. patent 2,497,058. Filed Feb. 15, 1945. Issued Feb. 7, 1950. 6 claims. Assigned to Sonoco Products Company. [Cl. 72-109]

A kraft paper tube is designed for use as a structural form for poured concrete. Means are provided for holding the tube in place during the pouring operation and for incorporating steel reinforcement in the concrete. E.G.S.

SCHWARTZBERG, LOUIS. Egg crate flat. Canadian patent 463,383. Filed Jan. 3, 1949. Issued Feb. 28, 1950. 3 claims.

This is the same as U. S. patent 2,490,326; *cf.* B.I.P.C. 20: 362. E.G.S.

WEST, PAUL B. Prefabricated concrete form. U. S. patent 2,455,455. Filed Dec. 12, 1946. Issued Dec. 7, 1948. 12 claims. [Cl. 72-48]

Corrugated paperboard forms are provided for use in the prefabrication of concrete walls, roofs, and floors; the corrugated sheet may be left in the finished concrete structure. E.G.S.

WISNER, ISADORE. Holder for phonograph records. U. S. patent 2,463,450. Filed April 8, 1948. Issued March 1, 1949. 3 claims. Assigned to Imperial Paper Box Corporation. [Cl. 129-20]

A cardboard container for phonograph records includes a stack of record envelopes which are pivotally attached inside the container. E.G.S.

YOUNG, LEWIS D. Display box. U. S. patent 2,466,346. Filed Sept. 9, 1947. Issued April 5, 1949. 2 claims. Assigned to Douglas Young, Inc. [Cl. 206-45.23]

A display box contains a display pad which may be removed from the box together with the attached merchandise. E.G.S.

CELLOPHANE

SALFISBERG, LEROY L. Method of making rectangular flat bags. U. S. patent 2,496,753. Filed Feb. 6, 1946. Issued Feb. 7, 1950. 1 claim. Assigned to Ivers-Lee Company. [Cl. 93-35]

A cellophane or Pliofilm flat bag-type package is initially formed with one edge open to form a mouth through which the substance to be packaged may be inserted; after filling, the unsealed edges are crimped together. E.G.S.

COMBINATION PACKAGES

AMENT, PHILLIP H., and BRUNET, PIERRE L. Combined cigarette and match box. Canadian patent 462,759. Filed April 17, 1948. Issued Jan. 31, 1950. 1 claim.

A strip of matches is stapled to the cover of a cigarette package and folds into the package when the cover is closed; the match-striking surface is located on the outer surface of the container. E.G.S.

LONGO, ANTHONY. Fresh produce package cooled by ice. U. S. patent 2,496,731. Filed June 8, 1946. Issued Feb. 7, 1950. 3 claims. Assigned to M. Longo & Sons Inc. [Cl. 62-86; changed to 99-193]

A cardboard carton is provided for fresh produce such as spinach, lettuce, and mixed salad vegetables. A number of individual packages of vegetables are arranged in the carton around a waterproof plastic bag of ice cubes; in this manner, the produce is kept crisp while on display. E.G.S.

FOLDING BOXES

BOLLING, WYTHE T., JR. Bobby pin package. U. S. patent 2,466,571. Filed April 22, 1946. Issued April 5, 1949. 4 claims. [Cl. 206-66]

A paper container which is similar to a match book is designed for the packaging of bobby pins, hairpins, and the like. E.G.S.

BUTTERY, KENNETH T. Double walled box or carton. U. S. patent 2,495,807. Filed Sept. 9, 1946. Issued Jan. 31, 1950. 6 claims. Assigned to Sutherland Paper Company. [Cl. 229-34]

A collapsible double-walled meat carton has completely closed corners and is paraffin-coated on its inner and outer surfaces. No raw edges are exposed to the packaged product, so that discoloration by juices or grease is eliminated. E.G.S.

COLGATE, WILLIAM H. Package. U. S. patent 2,497,071. Filed Nov. 21, 1944. Issued Feb. 14, 1950. 3 claims. [Cl. 206-45.31]

A display container is provided for match books or boxes. E.G.S.

CUPO, WILLIAM J. Carton and method of sealing the flaps thereof. U. S. patent 2,496,336. Filed Sept. 1, 1944. Issued Feb. 7, 1950. 2 claims. Assigned to Waldorf Paper Products Co. [Cl. 229-37]

A seal-end carton is provided with at least one closing and sealing flap which laps and adheres to a portion of the carton body after the carton is filled; the outer lapping part incorporates air-suction apertures, so that suction can be applied to hold the parts together during the adhesive sealing operation. E.G.S.

RAFOTH, BENNIE A. Carton. Canadian patent 463,204. Filed June 9, 1949. Issued Feb. 14, 1950. 1 claim. Assigned to Marathon Corporation.

This is the same as U. S. patent 2,475,294; *cf.* B.I.P.C. 19: 890. E.G.S.

RINGLER, WILLIAM A. Packing device for annular articles. U. S. patent 2,465,121. Filed Aug. 14, 1945. Issued March 22, 1949. 7 claims. Assigned to The Gardner-Richardson Company. [Cl. 206-46]

A cardboard packing device is provided for metal wool scouring pads, rubber bands, and other merchandise which can be packaged in an annular shape. E.G.S.

SIEWERT, EDWIN C. Spoon package. Canadian patent 462,885. Filed April 11, 1949. Issued Jan. 31, 1950. 1 claim. Assigned to Marathon Corporation.

This is the same as U. S. patent 2,469,343; *cf.* B.I.P.C. 19: 741. E.G.S.

GROUNDWOOD PULP

SUTHERLAND, DANIEL M. Manufacture of ground wood pulp. Canadian patent 463,385. Filed Feb. 12, 1948. Issued Feb. 28, 1950. 3 claims.

In the preparation of a groundwood pulp, the large slivers are removed by screening, the consistency of the stock is adjusted by the addition of hot water, and the resulting pulp is ground in a disk refiner at a temperature above 160° F. E.G.S.

INDICATORS AND TEST PAPERS

RUSSELL, HAROLD D., and CRABTREE, JOHN I. Stop bath acidity indicator. U. S. patent 2,464,155. Filed Feb. 9, 1945. Issued March 8, 1949. 6 claims. Assigned to Eastman Kodak Company. [Cl. 23-253]

An indicator paper is provided which will visually designate the degree of acidity of a photographic stop or fixing bath, as well as the changes in the acidity. The paper is prepared by treatment with a suitable indicator, such as Congo red. E.G.S.

LIGNIN

HIBBARD, ROBERT R., and VEATCH, FRANKLIN. Process for the removal of mercaptans from petroleum distillates with an aqueous alkaline reagent containing lignin and the regeneration of the spent alkaline reagent. U. S. patent 2,464,576. Filed April 18, 1946. Issued March 15, 1949. 10 claims. Assigned to The Standard Oil Company. [Cl. 196-29]

A 15% sodium hydroxide solution of a lignin additive (Indulin A, B, or C) is recommended for the "sweetening" (i.e., removal of mercaptans) of petroleum distillates, such as gasoline. E.G.S.

MACHINERY—CONVERTING MACHINERY

BENOIT, LEON, and VAHLE, RAYMOND. Automatic carton erecting machine. Canadian patent 463,068. Filed May 1, 1948. Issued Feb. 7, 1950. 24 claims. Assigned to Somerville Limited.

A machine and method are described for the assembly and erection of a cellular carton from a pair of complementary slitted blanks which have flaps with projecting hooks along one edge. E.G.S.

BENOIT, LEON, and VAHLE, RAYMOND. Carton erecting machine. Canadian patent 463,069. Filed May 1, 1948. Issued Feb. 7, 1950. 28 claims. Assigned to Somerville Limited.

A machine is adapted for the erection of a cellular carton from two foldable blanks, each of which has flaps hinged along one edge; the flaps of one blank are attached to the wall of the other blank to form a cross wall. E.G.S.

HARVEY, LEO M. Mechanism for handling production from cup forming machines or the like. U. S. patent 2,497,124. Filed March 28, 1944. Issued Feb. 14, 1950. 13 claims. [Cl. 93-60]

A mechanism is adapted for the removal of paper cups from a cup-forming machine and for the subsequent stacking of the cups in a nested formation. 28 figures. E.G.S.

MCLAUGHLIN, JOHN E., WILSKE, JULIUS E., and MCCORMICK, FRANCIS A. Partition strip assembling machine. U. S. patent

2,497,318. Filed June 7, 1944. Issued Feb. 14, 1950. 21 claims. Assigned to Owens-Illinois Glass Company. [Cl. 93-37]

A mechanism is designed to control the assembling motor of a cardboard partition strip-assembling machine. E.G.S.

NICHOLAS, JOHN. Apparatus for making paper and like bags. Canadian patent 462,896. Filed Aug. 25, 1947. Issued Jan. 31, 1950. 6 claims. Assigned to E. S. & A. Robinson, Limited.

A machine is described for the production of paper bags from a continuous length of tubular material. One of the open ends of the bag tube is folded to form the bottom of the bag. E.G.S.

ROSE, ALFRED G., and GILBERT, JOSEPH A. Bag-making apparatus. Canadian patent 462,899. Filed Jan. 5, 1948. Issued Jan. 31, 1950. 6 claims. Assigned to Rose Brothers (Gainsborough) Limited.

A bag-making apparatus includes means for folding a web of heat-sealing material around a former in the shape of a continuous tube; the edges of the web overlap to form a longitudinal seam. E.G.S.

RUZA, FREDERICK. Cup-making machine. U. S. patent 2,497,239. Filed March 22, 1944. Issued Feb. 14, 1950. 3 claims. Assigned to Paper Container Manufacturing Co. [Cl. 93-36.2]

A reciprocating die carriage is provided for a conical cup-making machine which incorporates means for winding an adhesively-treated paper blank into cup form on a conical mandrel. E.G.S.

MACHINERY—DECKLING

HORNBOSTEL, LLOYD. Automatic deckle edge separating press roll section. Canadian patent 462,812. Filed May 12, 1948. Issued Jan. 31, 1950. 11 claims. Assigned to Beloit Iron Works.

A method and apparatus are described for the separation of deckle-edge portions from a paper web without damaging the web, prior to the drying operation. E.G.S.

MACHINERY—DOCTORS

LJUNGQUIST, ERNST R. Doctor device for rolls and cylinders. U. S. patent 2,498,213. Filed June 17, 1946. Issued Feb. 21, 1950. 2 claims. Assigned to Lodding Engineering Corporation. [Cl. 92-74]

A doctor blade is designed for use with calender rolls, drier drums, and the like; although the blade is removable for replacement purposes, it is held from sliding forward out of its holder during operation. The invention embodies some of the features of U. S. patent 2,117,032, which issued May 10, 1938. E.G.S.

LJUNGQUIST, ERNST R. Doctor mechanism for paper machines. U. S. patent 2,498,214. Filed June 20, 1946. Issued Feb. 21, 1950. 1 claim. Assigned to Lodding Engineering Corporation. [Cl. 92-74]

Means are provided for moving a cylinder-roll doctor blade back and forth in a direction parallel to the axis of the calender roll which is being doctored. E.G.S.

MACHINERY—DRYERS

HORNBOSTEL, LLOYD. High-pressure fluid sealing assembly. U. S. patent 2,496,471. Filed March 14, 1947. Issued Feb. 7, 1950. 14 claims. Assigned to Beloit Iron Works. [Cl. 285-10]

A fluid-sealing assembly is designed to maintain a fluid-tight seal between a rotating shaft and a stationary casing, where one of the members is exposed to a high-pressure fluid. The invention is particularly applicable as a steam journal for use in conjunction with the rotatable drier drum of a paper-making machine. E.G.S.

MACHINERY—JORDANS

LARSON, OSCAR E. Plural section straight knife jordan engine lining. Canadian patent 463,153. Filed April 27, 1948. Issued Feb. 14, 1950. 7 claims. Assigned to John W. Bolton & Sons, Inc.

The lining for a jordan consists of four or more frusto-conical sections which are arranged end to end; each section is built up of straight knives, each positioned at an angle of at least 5% (about 3°) from a radial plane through the axis of the shell. E.G.S.

MACHINERY—PACKAGING MACHINERY

ROSS, NORMAN S. Packaging machine. U. S. patent 2,464,099. Filed Oct. 10, 1945. Issued March 8, 1949. 2 claims. Assigned to Pneumatic Scale Corporation, Limited. [Cl. 93-2]

A machine is provided for the packaging of compactible materials, such as soap flakes, dehydrated foods, and the like; a tapered block serves to compress the packaged material into the carton. E.G.S.

SALFISBERG, LEROY L. Method and machine for packaging or wrapping of articles. U. S. patent 2,468,517. Filed Aug. 10, 1945. Issued April 26, 1949. 7 claims. Assigned to Ivers-Lee Company. [Cl. 93-3]

Equipment is provided for packaging and hermetically sealing medicinal tablets and powders in Pliofilm or cellophane wrappers. E.G.S.

YOUNG, ERNEST H., and NOWACKI, ANDREW W. Apparatus for wrapping shrubs. U. S. patent 2,467,286. Filed March 14, 1947. Issued April 12, 1949. 15 claims. Assigned to Comstock & Wescott, Inc. [Cl. 93-2]

An apparatus is provided for the spiral wrapping of shrubs or small trees with laminated crepe paper. E.G.S.

MACHINERY—PASTING MACHINE

RIDDLE, WALTER S. Spot cementing apparatus for a laminating machine. Canadian patent 462,900. Filed July 14, 1949. Issued Jan. 31, 1950. 2 claims. Assigned to Seaman Paper Company.

This is the same as U. S. patent 2,488,685; *cf.* B.I.P.C. 20: 288-9. E.G.S.

SHIELDS, ALBERT F. Taping machine. U. S. patent 2,467,275. Filed Dec. 5, 1945. Issued April 12, 1949. 13 claims. Assigned to The S & S Corrugated Paper Machinery Co., Inc. [Cl. 93-56]

An automatic taping device is particularly adapted for the taping of the seams of paper boxes and cartons; after the tape has been applied, it is automatically cut to the proper length. Means are provided for the maintenance of exact registry between the tape and the seam throughout the sealing operation. E.G.S.

MACHINERY—SAWS

CHARTERS, GEORGE W. Mechanical off-bearing flared rolls. U. S. patent 2,468,036. Filed Oct. 2, 1945. Issued April 26, 1949. 2 claims. Assigned to Crown Zellerbach Corporation. [Cl. 143-157]

Mechanical means are provided for the removal of a slab as it is sawed from a log and for the subsequent positioning of the slab with its flat or sawed face down. E.G.S.

MACHINERY—SCREENS

WADLEIGH, GEORGE R. Holding device. U. S. patent 2,468,249. Filed May 19, 1945. Issued April 26, 1949. 2 claims. Assigned to West Virginia Pulp and Paper Company. [Cl. 210-172]

A holding device is designed to hold and change interchangeable screens which are used to filter solid material from a stream or reservoir of water. E.G.S.

MACHINERY—SLITTERS AND WINDERS

HORNBOSTEL, LLOYD, and BEACHLER, EDWARD D. Shaft winder. U. S. patent 2,467,554. Filed May 31, 1944. Issued April 19, 1949. 7 claims. Assigned to Beloit Iron Works. [Cl. 164-65]

A paper web is slit as it is wound on a center wind-type winder, or a number of such winders; after being slit and wound, the paper is ready for delivery to a supercalender stack. E.G.S.

MACHINERY—WIRES

HOSE, ALFRED G., and DILLEY, DONALD C. Seam for woven wire fabric. U. S. patent 2,496,052. Filed March 11, 1948. Issued Jan. 31, 1950. 4 claims. Assigned to The Lindsay Wire Weaving Company. [Cl. 139-425; changed to 245-10]

An eight-carat gold alloy is recommended for connecting the ends of a wire fabric to form a continuous Fourdrinier wire; the alloy has a melting point of about 1250° F. and is composed of 33% gold, 26% silver, 21% copper, 10% zinc, and 10% cadmium. E.G.S.

MATERIALS HANDLING

BALDWIN, HAROLD L. Log handling equipment. U. S. patent 2,467,354. Filed July 31, 1945. Issued April 12, 1949. 4 claims. [Cl. 214-38]

This invention comprises a movable conveyor which is installed at a loading station in the woods, upon which the logs may be initially stacked, in combination with a truck equipped with a power take-off; the truck also carries a conveyor which may be connected with the conveyor at the loading station so that the logs may be conveyed en masse into the truck. Freight cars and receiving platforms may be equipped with similar co-operating conveyors. E.G.S.

MOLDED PULP ARTICLES

HEYMANN, ROY D. Hunter's decoy. U. S. patent 2,495,720. Filed April 5, 1945. Issued Jan. 31, 1950. 1 claim. Assigned to Animal Trap Company of America. [Cl. 43-3]

A molded pulp bird decoy is provided with means for ballasting the body as required. The exterior is coated with a water-repellent paint, resin, or plastic. E.G.S.

HEYMANN, ROY D. Hunter's decoy. U. S. patent 2,495,721. Filed March 18, 1947. Issued Jan. 31, 1950. 17 claims. Assigned to Animal Trap Company of America. [Cl. 43-3]

A hollow pulp duck decoy incorporates means for adding liquid ballast to adjust the trim of the decoy as it floats in the water. E.G.S.

SHERMAN, FRANCIS H. Moulded pulp egg carton. Canadian patent 463,226. Filed April 2, 1947. Issued Feb. 14, 1950. 10 claims. Assigned to Shellmar Products Corporation.

A molded pulp egg carton is provided with locking tabs on the lid which can be inserted in tab-receiving openings in the bottom portion of the carton. E.G.S.

PAPER—COATED

FOSTER, NEWTON C. Process for the polymerization of styrene and monoallyl maleate. U. S. patent 2,482,087. Filed Dec. 29, 1945. Issued Sept. 20, 1949. 4 claims. Assigned to Westinghouse Electric Corporation. [Cl. 260-78.5; changed to 260-31.2]

A coating and impregnating composition for paper consists of 47 parts of monostyrene, 40 parts of monomethallyl maleate, 0.6 part of benzoyl peroxide, and 200 parts of acetone. E.G.S.

JAYNE, DAVID W., JR., and DAY, HAROLD M. Process of reacting dicyandiamide and aniline. U. S. patent 2,482,710. Filed March 24, 1945. Issued Sept. 20, 1949. 1 claim. Assigned to American Cyanamid Company. [Cl. 260-249.5]

A coating, molding, laminating, and paper-treating composition is prepared by the combination of an aldehyde (e.g., formaldehyde) with the reaction product of 165 parts of aniline, 149 parts of dicyandiamide, and 3 parts of zinc chloride. E.G.S.

SZWARC, ALEXANDER. Water-vapor resistant coated paper. U. S. patent 2,496,566. Filed Oct. 19, 1946. Issued Feb. 7, 1950. 2 claims. [Cl. 117-155; changed to 117-138.5]

A 45-pound kraft paper is coated with a plasticized resin-asphalt wax compound having the following composition: mineral rubber, 79%; coumarone indene resin, 12%; methyl ester of rosin, 2%; paraffin wax, 6%; and copper naphthenate, 1%. The coating process is carried out at a temperature of 425° F., and the surplus coating is removed with a doctor blade. The finished product contains 28% by weight of the coating material; it exhibits good fungicidal properties and has a low water-vapor permeability. E.G.S.

VAN GUELPEN, LOUIS J. Apparatus for coating webs. U. S. patent 2,464-771. Filed April 9, 1946. Issued March 15, 1949. 10

claims. Assigned to The Interstate Folding Box Company. [Cl. 91-43]

A coating machine permits the accurate control of the amount of coating applied to a paper web over a wide range (e.g., 6-60 lb./ream). The apparatus is adapted for use with paraffin and thermoplastic coatings. E.G.S.

PAPER—COATED (HOT-MELT)

SALO, MARTIN, and VIVIAN, HAROLD F. Hot melt coating composition. U. S. patent 2,481,687. Filed March 30, 1946. Issued Sept. 13, 1949. 7 claims. Assigned to Eastman Kodak Company. [Cl. 106-181; changed to 106-179]

A hot-melt coating composition consists of 59 parts of cellulose acetate butyrate (butyryl content, 47.6%; acetyl content, 6%; and viscosity, 33 centipoises at 25° C. in a 10% solution in acetone), 31 parts of Aroclor No. 5460 (a chlorinated diphenyl), 10 parts of octyl phthalate, and one part of paraffin. The resulting coating has good abrasion resistance and low water-vapor permeability. E.G.S.

PAPER SIZING

DECEW, JUDSON A. Sizing. Canadian patent 463,106. Filed Dec. 24, 1947. Issued Feb. 14, 1950. 10 claims.

A sizing process involves the deposition of a coating of basic aluminum sulfate on the pulp fibers while they are immersed in an acidic aluminum sulfate solution, and the subsequent addition of a rosin emulsion to precipitate a rosinous size on the fibers. The colloidal solution of basic aluminum sulfate is prepared from the reaction of soda ash with alum in solution; the soda ash should not constitute less than 12% of the sulfate content of the alum on a dry weight basis. E.G.S.

PAPER SPECIALTIES

ALLEN, ADDA M. Cap for nonrigid disposable nursing bottles. U. S. patent 2,497,197. Filed Jan. 25, 1946. Issued Feb. 14, 1950. 4 claims. Assigned to Disposable Bottle Corporation. [Cl. 215-11]

A disposable paper nursing bottle is provided with means for attachment to a rigid nipple-engaging cap. E.G.S.

ALLEN, ADDA M. Wide mouth nursing unit. U. S. patent 2,497,198. Filed Dec. 14, 1945. Issued Feb. 14, 1950. 3 claims. Assigned to Disposable Bottle Corporation. [Cl. 215-11]

A nonrigid, disposable, paper nursing bottle is adapted for attachment to a cap which supports a flanged-type nipple. E.G.S.

AUCHTER, RICHARD J. Process of manufacturing a fibrous sheet covered plywood. U. S. patent 2,497,712. Filed June 5, 1944. Issued Feb. 14, 1950. 2 claims. Assigned to Paper Patents Company. [Cl. 154-132]

This covers the manufacture of a fibrous sheet-covered plywood, which is included as a part of Canadian patent 442,631; *cf.* B.I.P.C. 17: 741. E.G.S.

BAYNES, WILLIAM C. Greeting card and envelope assembly. U. S. patent 2,497,064. Filed May 22, 1947. Issued Feb. 14, 1950. 12 claims. [Cl. 229-92.8; changed to 206-63]

A price tag is adhesively secured to an undecorated or unexposed face of a French-folded greeting card or envelope, but may be detached at the time of sale. E.G.S.

BENNETT, CLARENCE G. Butter package. U. S. patent 2,497,203. Filed Nov. 12, 1947. Issued Feb. 14, 1950. 2 claims. Assigned to Paterson Pacific Parchment Company. [Cl. 99-179]

A composite butter wrapper comprises a relatively water- and moisture-impermeable outer base sheet, an intermediate layer of a water-soluble mold-retarding material (i.e., sodium chloride, sodium propionate, calcium propionate, or mixtures thereof), and a relatively water-permeable inner sheet of vegetable parchment. E.G.S.

BERNSTEIN, LEO. Nonremovable garment tag having folded staple ends concealed. U. S. patent 2,464,113. Filed Jan. 9, 1945. Issued March 8, 1949. 2 claims. [Cl. 40-20; changed to 40-2]

A sealed garment display tag is attached to a garment in such a manner that it cannot be removed without mutilation. E.G.S.

CALLINAN, THOMAS D. Asbestos product containing tin. Canadian patent 463,401. Filed Sept. 26, 1945. Issued Feb. 28, 1950. 2 claims. Assigned to Canadian General Electric Company.

This corresponds to U. S. patent 2,460,734; *cf.* B.I.P.C. 19: 521. E.G.S.

COOK, CHARLES B., JR. Carbon paper. U. S. patent 2,496,856. Filed June 12, 1946. Issued Feb. 7, 1950. 2 claims. [Cl. 282-28]

A carbon paper is provided with fine, parallel corrugations (25-40 per inch) which serve as stiffening ribs to prevent curling of the paper. E.G.S.

EGERTON, LAWSON. Manufacture of electrical apparatus. U. S. patent 2,463,756. Filed March 22, 1944. Issued March 8, 1949. 9 claims. Assigned to Bell Telephone Laboratories, Incorporated. [Cl. 117-60]

The electrodes of an electrical condenser are separated by kraft paper spacers which have been impregnated with chlorinated diphenyl. E.G.S.

FLEISCHER, NATHAN I. Packing cord. U. S. patent 2,465,081. Filed Nov. 20, 1945. Issued March 22, 1949. 6 claims. Assigned to The Fleischer Mills Incorporated. [Cl. 87-6]

A packing cord comprises a soft resilient filler of crepe paper which is wrapped around a central cordlike core member; the core is adapted to impart elasticity and tensile strength to the product. E.G.S.

HARTMAN, ARTHUR G. Sealing of paper container. Canadian patent 462,771. Filed June 8, 1945. Issued Jan. 31, 1950. 4 claims.

The seams of a paper bag are sealed with a nontacky, flexible coating, which consists of one part of a hydrogenated castor oil and two to ten parts of a solid mineral wax. E.G.S.

HARWOOD, KENNETH J. Method of making tampons. U. S. patent 2,464,310. Filed Aug. 25, 1945. Issued March 15, 1949. 7 claims. Assigned to International Cellucotton Products Company. [Cl. 18-55]

This is the same as Canadian patent 462,243; *cf.* B.I.P.C. 20: 457. E.G.S.

HENRY, MAYNARD E., SR., and CARBAUGH, WALTER P. Mothproof container. U. S. patent 2,462,966. Filed Oct. 16, 1945. Issued March 1, 1949. 2 claims. [Cl. 206-10]

A heavy kraft paper garment storage bag is coated on its inner surface with a heat-sealing adhesive; when a garment is to be stored in the bag, the unjoined edges are brought together and sealed by the application of a hot iron. E.G.S.

HERMANSON, WILLIAM A. Composite transparent sheet. U. S. patent 2,496,665. Filed June 10, 1949. Issued Feb. 7, 1950. 5 claims. [Cl. 117-15; changed to 117-13]

A composite, transparent paper web consists of a mixture of randomly deflocculated synthetic organic fibers (10-50% of denier 5.5, the balance of denier 1.5-3) which are intimately mixed in overlapping, crisscross, and heterogeneous relation to each other. The resulting comparatively large interstices (25-150 microns) extend randomly through the full thickness of the sheet; the web is completely filled with a transparent polymerized synthetic resin. E.G.S.

INNACELLI, FRANK L. Paper fastener. U. S. patent 2,468,072. Filed Oct. 28, 1944. Issued April 26, 1949. 2 claims. [Cl. 24-153]

A paper fastener assembly consists of a fastener, a compressor plate, and a keeper, which are formed from cardboard or fiberboard; the compressor plate and keeper are preferably less flexible than the fastener. E.G.S.

KARDON, EMANUEL S. Bag and method of making the same. U. S. patent 2,496,796. Filed Oct. 11, 1947. Issued Feb. 7, 1950. 2 claims. [Cl. 229-59]

A self-opening, satchel bottom-type paper bag is adapted for manufacture on an automatic bag-making machine. An inner liner seals the bottom of the bag against leakage. E.G.S.

KELLGREN, WALDO. Pressure-sensitive adhesive tape. Canadian patent 463,043. Filed Nov. 18, 1946. Issued Feb. 7, 1950. 4 claims. Assigned to Minnesota Mining & Manufacturing Company.

A pressure-sensitive adhesive masking tape comprises a creped paper backing impregnated with a water-insoluble, flexible, stretchable, fiber-binding composition; a normally tacky, water-insoluble, pressure-sensitive, rubbery adhesive coating is firmly united to one side of the backing; an amino-aldehyde-alcohol resin backsizing is plasticized with a compatible xylol-soluble castor oil-modified alkyd resin. E.G.S.

KELLGREN, WALDO, and CHARPENTIER, JESSE J. Liner for adherent rubber surfaces and the like. U. S. patent 2,496,349. Filed Sept. 26, 1945. Issued Feb. 7, 1950. 6 claims. Assigned to Minne-

sota Mining & Manufacturing Company. [Cl. 117-155; changed to 206-59]

A creped paper liner for a pressure-sensitive adhesive tape is coated on both sides with a nonbleeding composition which consists of 100 parts of polyvinylbutyral, 65 parts of hydrogenated castor oil wax, 10 parts of a higher fatty acid, and 2 parts of an organic rubber antioxidant. The coating composition has a low adherency to the pressure-sensitive adhesive. E.G.S.

RUBEN, SAMUEL. Method of making depolarizer units for alkaline primary cells. U. S. patent 2,481,539. Filed May 10, 1943. Issued Sept. 13, 1949. 6 claims. [Cl. 136-107; changed to 136-175]

A hermetically sealed primary cell of the metal oxide-zinc type incorporates a zinc-foil anode; in assembling the cell, porous strips of 4-mil Dexter paper are laid on a zinc-foil strip, and the foil and paper are wound onto a zinc mandrel, forming a roll; a Pliofilm sleeve is slipped over the whole assembly. E.G.S.

SALFISBERG, LEROY L. Composite package. U. S. patent 2,465,172. Filed May 11, 1946. Issued March 22, 1949. 3 claims. Assigned to Ivers-Lee Company. [Cl. 206-46]

A package for powder, paste, or tablets consists of a paper or cardboard backing layer, upon which two layers of Pliofilm or cellophane are superimposed; the latter are heat sealed at their edges to form and bound a commodity-receiving compartment. E.G.S.

SALFISBERG, LEROY L. Infusion package. U. S. patent 2,468,464. Filed Feb. 7, 1946. Issued April 26, 1949. 4 claims. Assigned to Ivers-Lee Company. [Cl. 206-0.5]

A string is attached to a paper tea bag in such a manner that it is normally concealed or covered, thus preventing entanglement with the strings of other bags in a carton. E.G.S.

SHAW, WILLIAM R. Tea bag. U. S. patent 2,466,281. Filed Sept. 23, 1947. Issued April 5, 1949. 3 claims. [Cl. 99-77.1]

A tea bag is provided with suspension cords which are interlaced in such a manner that liquid can be expelled from the bag by pulling the cords outwardly in opposite directions. E.G.S.

STRONG, JAMES H. Paper parachute. U. S. patent 2,495,873. Filed Dec. 7, 1948. Issued Jan. 31, 1950. 6 claims. [Cl. 244-142; changed to 244-145]

A paper parachute is provided for the suspension of aerial instruments which have been released from sounding balloons. The canopy is preferably made of a light, strong, smooth calendered paper which has been coated or impregnated with wax to render it waterproof. E.G.S.

WELSH, CHARLES E. Polysiloxane resins. U. S. patent 2,449,572. Filed Aug. 11, 1944. Issued Sept. 21, 1948. 14 claims. Assigned to General Electric Company. [Cl. 260-46.5]

A polysiloxane resin is suitable for the impregnation of paper, glass cloth, or cotton to form dielectric sheets for condensers. E.G.S.

PLASTICS—HONEYCOMB

MAY, GEORGE. Structural elements made from paper and like sheets. Canadian patent 462,851. Filed Dec. 28, 1946. Issued Jan. 31, 1950. 9 claims. Assigned to Dufay-Chromex Limited.

A cellular filling for a double-skin structural element is produced by the application of lines of adhesive to a number of flexible paper plies which are impregnated with a phenol- or cresyl-formaldehyde high-wet strength resin, superimposition of the plies in a staggered formation, and expansion of the adhering plies to form a cellular structure. When the impregnated material hardens, the structure becomes rigid. E.G.S.

PLASTICS—PAPER-BASE

DONAHUE, WILLIAM T. Grained laminated structure. U. S. patent 2,496,122. Filed March 8, 1946. Issued Jan. 31, 1950. 1 claim. [Cl. 154-45.9]

A grained laminated structure consists of a transparent covering sheet, a creped paper facing sheet, and a laminated base, all bonded together with a synthetic resin binder. The facing sheet is colored to produce a simulated grained finish. E.G.S.

GREEN, LAWRENCE B. Method and apparatus for forming plastic laminates. U. S. patent 2,496,911. Filed June 7, 1945. Issued Feb. 7, 1950. 34 claims. Assigned to Shellmar Products Corporation. [Cl. 154-124; changed to 154-37]

A method and apparatus are described for impregnating a paper, glass-cloth, or textile web with a polymerizable resin; the resin is cured by passing the impregnated material under a bank of heat lamps. E.G.S.

SHIPPING CONTAINERS

ROCKFELLER, BEVERIDGE J. Roll film container and package. Canadian patent 463,147. Filed Oct. 21, 1947. Issued Feb. 14, 1950. 11 claims. Assigned to Bakelite Company (Canada) Limited.

A storage and shipping container is provided for a roll of film which is wound on a core that projects from the ends of the roll; removable corrugated core supports are inserted at either end of the carton. E.G.S.

SHIPPING CONTAINERS—FROZEN FOODS

MERKLE, GUSTAV. Shipping package using dry ice. U. S. patent 2,467,268. Filed Dec. 8, 1943. Issued April 12, 1949. 7 claims. Assigned to Sherman Paper Products Corporation. [Cl. 62-1]

A refrigerated shipping package for fish, oysters, clams, and other heat-sensitive foods incorporates a refrigerant chamber in conjunction with two adjacent refrigerated chambers. Thermal control pads, which consist of laminated, folded sheets of kraft paper coated with a flexible binder (e.g., a moisture-resistant, odorless, thermoplastic mixture of petroleum asphalt and oil) of low thermal conductivity, are placed between the refrigerant and refrigerated chambers. The refrigerant is solid carbon dioxide. E.G.S.

SCHWARTZBERG, LOUIS. Frozen egg method and container. U. S. patent 2,496,755. Filed April 9, 1945. Issued Feb. 7, 1950. 3 claims. [Cl. 99-196]

A waxed container is provided with compartments for frozen eggs from which the shells have been removed; the carton is about one fourth as deep as the standard egg carton. E.G.S.

SOUNDPROOFING

PARÉ, VICTOR T. Acoustic wall structure. Canadian patent 463,055. Filed Jan. 5, 1945. Issued Feb. 7, 1950. 4 claims. Assigned to Radio Corporation of America.

This is the same as U. S. patent 2,488,555; *cf.* B.I.P.C. 20: 294. E.G.S.

SULFITE WASTE LIQUOR

LARSSON, ERIC J., and JONSSON, JOHN H. Methods of recovering chemicals in the manufacture of cellulose by digestion according to the alkaline sulfite and/or alkaline bisulfite methods. U. S. patent 2,496,550. Filed July 6, 1948. Issued Feb. 7, 1950. 6 claims. Assigned to Stora Kopparbergs Bergslags Aktiebolag. [Cl. 23-64]

A process is described for the recovery of the alkali salts from alkaline sulfite waste liquor. The waste liquor is evaporated and burned to form a molten mass containing sodium sulfide; the molten mass is dissolved in water, and carbon dioxide is introduced into the resulting solution, thus forming sodium bicarbonate. The addition of carbon dioxide is continued until the solution is almost saturated with sodium bicarbonate; the hydrogen sulfide is driven off by heating, and additional carbon dioxide is introduced. Sodium bicarbonate crystallizes from the solution and is separated from the liquid. E.G.S.

TALL OIL

BENT, FRANKLIN A., and PETERSON, ELBERT A. Tall oil resins and their production. Canadian patent 463,224. Filed Aug. 21, 1944. Issued Feb. 14, 1950. 16 claims. Assigned to Shell Development Company.

This corresponds to U. S. patent 2,424,074; *cf.* B.I.P.C. 17: 744. E.G.S.

HERKENHOFF, EARL C. Froth flotation of iron ores, including use of alkali phosphate. U. S. patent 2,496,050. Filed Oct. 5, 1948. Issued Jan. 31, 1950. 4 claims. Assigned to American Cyanamid Company. [Cl. 209-166]

Iron oxide ores (e.g., those containing magnetite, hematite, etc.) are beneficiated by subjection of the aqueous pulp to froth flotation in the presence of an anionic-type promoter selected from the group consisting of the higher fatty acids, resin acids, naphthenic acids, tall oil, the sulfonates of such acids, and the corresponding sodium, potassium, and ammonium soaps. E.G.S.

MCMURRAY, LYNN L. Starch-caustic in apatite-ilmenite froth flotation. U. S. patent 2,466,995. Filed Dec. 20, 1945. Issued April 12, 1949. 10 claims. Assigned to American Cyanamid Company. [Cl. 209-167]

Phosphorus-bearing minerals such as apatite are separated from metallic oxide minerals such as ilmenite, rutile, magnetite, hematite, and the like, by froth flotation. A starch-caustic mixture serves as the ilmenite depressant, and tall oil is used as the anionic-type apatite promoter. E.G.S.

MYERS, LATIMER D., and MUCKERHEIDE, VICTOR J. Cutting oil base. U. S. patent 2,466,645. Filed Nov. 1, 1944. Issued April 5, 1949. 1 claim. Assigned to Emery Industries, Inc. [Cl. 252-42]

A cutting-oil base is prepared from tall oil by the esterification of the fatty acids in the tall oil with a sufficient quantity of propylene glycol to convert the fatty acids to the mono esters of propylene glycol, and by the subsequent saponification of the rosin acids of the tall oil into water-soluble alkali-metal soaps. E.G.S.

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